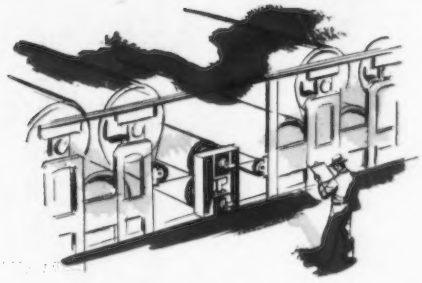
SEPTEMBER 28, 1959

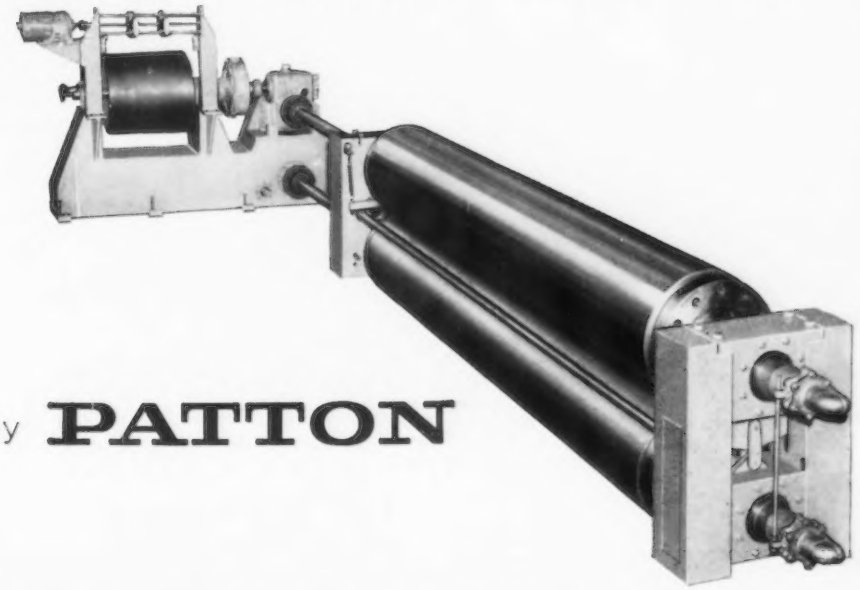
PAPER TRADE JOURNAL

FLAT BELT DRIVES . . .
have a new future with advent of nylon core belts. Extensive article lists trends and designs

HEATING AND DRYING . . .
symposium discusses what's new in high velocity, radiant, ink drying, with three other papers



SMOOTHING PRESSES



by PATTON

THE PATTON MANUFACTURING COMPANY, INC. • SPRINGFIELD, OHIO
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Buckeye always aims high

Improvement is our goal . . . in forest, laboratory and mill

Today's best is not good enough for tomorrow at Buckeye. As a market pulp producer, our future is based on continued leadership in pulp improvement.

Throughout the Buckeye organization you see men dedicated to the development of pulps for the years to come. They are the research foresters seeking faster growing trees with special pulp characteristics. They are the chemists engaged in basic research for product improvement. They are the engineers setting up new and improved manufacturing processes.

For a dependable source of prime kraft, today and tomorrow, look to Buckeye . . . producer of outstanding pulps for the paper industry.

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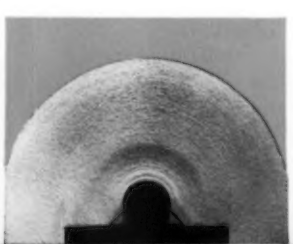
CELLULOSE CORPORATION
Memphis 8, Tenn.

Wood pulp plant at Foley, Florida
Cotton linters plant at Memphis

BUCKEYE PULP

Bleached and Semi-Bleached
Kraft from Southern Pine



THIS METAL IN JORDAN FILLINGS

BOLTON SPECIAL STAINLESS

. . . means more to papermakers than any steel developed in two decades

Its unique properties provide: absolute resistance to corrosion from chemicals normally encountered in refining equipment — protection of the cutting edges against wear and abrasion — toughness to withstand deformation without fracture — and the capacity to resist severe shock.

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Bolton Special Stainless is a chrome-nickel alloy having a chrome and nickel content approximating that in 300 series Stainless. It has made possible a form of heat-treating never before used commercially on steel for refining equipment. Known as precipitation hardening, this in-plant custom heat-treating gives the finished steel the unique character of being entirely free of stresses. This Bolton heat treatment makes it practicable to control the relationship of mechanical properties of the metal to meet the specialized requirements of paper mill refining operations.

Brinell Hardness	Tensile Strength (Average Minimum)	% Elongation (2")	% Reduction of Area
321	180,200	16.4	74.2
363	199,300	14.5	41.9
415	211,700	14.0	32.1

Various heat treatments for differing mill applications

It has taken years to prove this metal under all operating conditions. Now we have standardized our inventories on Bolton Special Stainless. We are proud to offer this premium quality stainless at no additional cost. Bolton Special Stainless is on hand in quantity to make prompt shipments to the growing number of papermakers *who have compared* — in all patterns, in all makes of Jordans. Don't wait. Try it now. *Call or write John W. Bolton & Sons, Inc., Lawrence, Massachusetts.*

BOLTON EMERSON

Texaco Paper Machine Oil HD gives full-time protection against the major causes of bearing failure

Water, heat and contaminants do more to shorten bearing life, provoke unexpected production stoppages, than any other factors. With Texaco Paper Machine Oil HD in the circulating system, you get positive, dependable protection against all three of these hazards.

Here's why. Texaco Paper Machine Oil HD is a premium grade lubricant fortified with detergent and dispersive agents, rust preventives and oxidation inhibitors. It provides a tough lubricating film that's proof against extreme pressures and temperatures. The rust protection helps to keep bearings bright-clean, whether the machine's running or idle. The inhibitors keep heat and moisture from building up sludge. And the detergent and dispersive agents keep carbonaceous material entrained in the oil instead of letting it settle out where it can clog oil passages.

For more information about Texaco Paper Machine Oil HD, just call the nearest of the more than 2,300 Texaco Distributing Plants, or write:

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PAPER TRADE JOURNAL

PUBLISHED WEEKLY SINCE 1872

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REMEMBER THESE DATES

Oct. 8-9. Fibre Box Assn., Annual Meeting, Waldorf-Astoria Hotel, New York, N. Y.

October 8-9. Deinking Conference, Roger Smith Hotel, Holyoke, Mass.

October 12-15. TAPPI Engineering Conference, Hotel Penn, Pittsburgh, Pa.

November 4-6. Alkaline Pulping Conference, Hotel Robert Meyer, Jacksonville, Fla.

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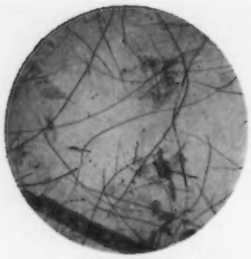
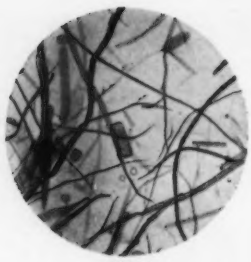
WHEAT STRAW



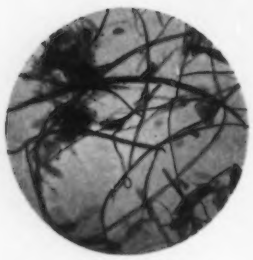
RICE STRAW



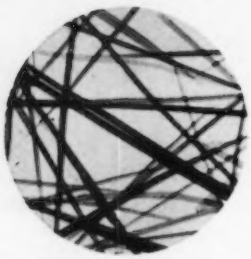
REEDS
(phragmites communis)

ELEPHANT GRASS
(before cleaning)

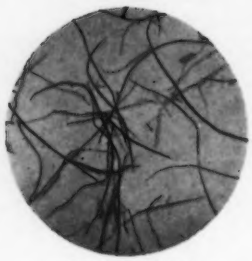
We build pulp and paper mills



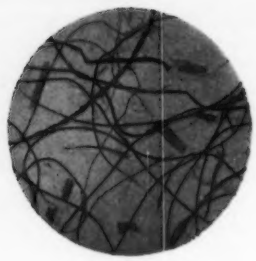
CORN STALK
(before depithing)



SUGAR CANE BAGASSE
(completely depithed)



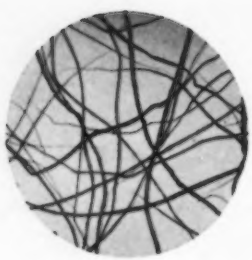
ESPARTO GRASS



BAMBOO

around the world

magnification:
approx. 35x



KENAF

MANILA HEMP

EUCALYPTUS SALIGNA

MONTEREY PINE

using these locally-abundant raw materials

Many countries have improved their economic position by making pulp and paper from locally-abundant grasses, woods and agricultural fibers. They began by having Parsons & Whittemore conduct a thorough technical and economic field survey. The selection of the proper process and equipment for use of such fibers is dependent upon many factors that can only be properly evaluated by highly-experienced personnel.

Field research is only one of Parsons & Whittemore's services. Our organization has world-wide technical, financial and machinery-manufacturing facilities that enable us to plan and supervise the designing, engineering, financing, construction and equipment of pulp and paper mills in any country having the required raw materials. We will even train local workers to operate the mill...and our branch offices will arrange for the sale of the plant's pulp and paper output on world markets. For information on any or all of these services, write to our nearest office.

THE PARSONS & WHITTEMORE / LYDDON ORGANIZATION

World leaders in the development of pulp and paper mills for the use of local fibers

18-19 Savile Row, London W. 1, England

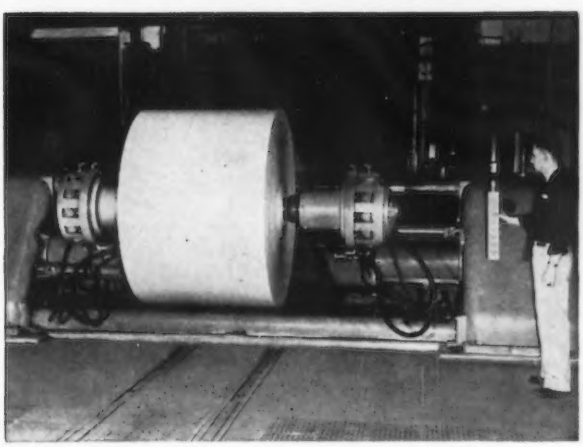
5 Rue Jean Mermoz, Paris 8°, France

250 Park Avenue, New York 17, N. Y.

Ready for the roll. Notice the absence of a shaft. Roll is moved in between lifting arms which close under pressure and elevate to desired height.

LANGSTON SHAFTLESS UNWIND STAND

Boost your production . . . reduce your slitting and rewinding costs



Easy, fast, completely safe. One man does everything. Operating push-button controls, he closes lifting arms, elevates roll, sets brakes.

One man can load the heaviest roll. No heavy shaft to handle. No cone tightening. No couplings to engage. No crane lifting. Just pushbuttons. This is the Langston heavy duty shaftless unwind stand for rewinding and converting applications.

You not only save time, you also get better unwinding. Roll can be positioned laterally by push-button control—even when the machine is running. It's held firmly under pressure for complete safety throughout the unwind. Several braking arrangements can be provided to handle a wide range of grades and conditions. Available extras provide for handling very narrow rolls; for constant tensioning; for automatic braking of idler rolls; for automatic web alignment and side register control; for web oscillation; and for local or remote control.

This new Langston shaftless unwind stand can be used with any make of slitter. Available for maximum roll widths from 40 to 132 in. and diameters from 14 to 84 in. Speeds to 3000 fpm and higher. For complete information, write Samuel M. Langston Co., Camden 4, N. J.

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Your paper machine is only as good as its felts

The finest machine in the world will go only as fast as its felts will allow.

Albany Felts get the best performance out of your machines because they're custom-designed and custom-built . . . like a made-to-measure suit of clothes that takes into consideration every individual requirement.

Your Albany Felt Sales Engineer is trained to survey your paper machine and measure its efficiency of felt application. His specialty is setting in motion Albany Felt's 4-step design service.

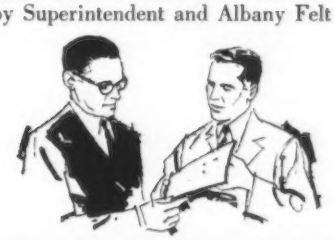
Working with him is a team of research, design and production experts known the world over. Together, they can help you make sure your machine is clothed correctly for more tons per day, more days per felt.

S. Stuart Engle

S. Stuart Engle,
Chief Designer

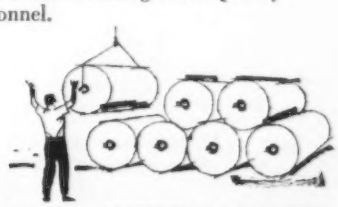
NEW IDEAS FOR BETTER PAPERMAKING—FROM

❶ **FIRST STEP IN ALBANY FELT EFFICIENCY SURVEY** is discussion of aims and operating problems by Superintendent and Albany Felt Sales Engineer, with all pertinent data recorded.



❷ **ANALYZING THE SALES ENGINEER'S REPORT,** Albany Felt Design specialists determine the felt specifications that will best solve customer's felt application problem.

❸ **DESIGN SPECIALIST REVIEWS REQUIREMENTS** with Manufacturing and Quality Control personnel.



❹ **RESULT: MAXIMUM FELT LIFE AND MAXIMUM DAILY PRODUCTION!**

ALBANY FELT COMPANY

Main Office and Plant: Albany, N. Y.

Other Plants: Hoosick Falls, N. Y., N. Monmouth, Me., St. Stephen, S. C., Cowansville, P. Q.

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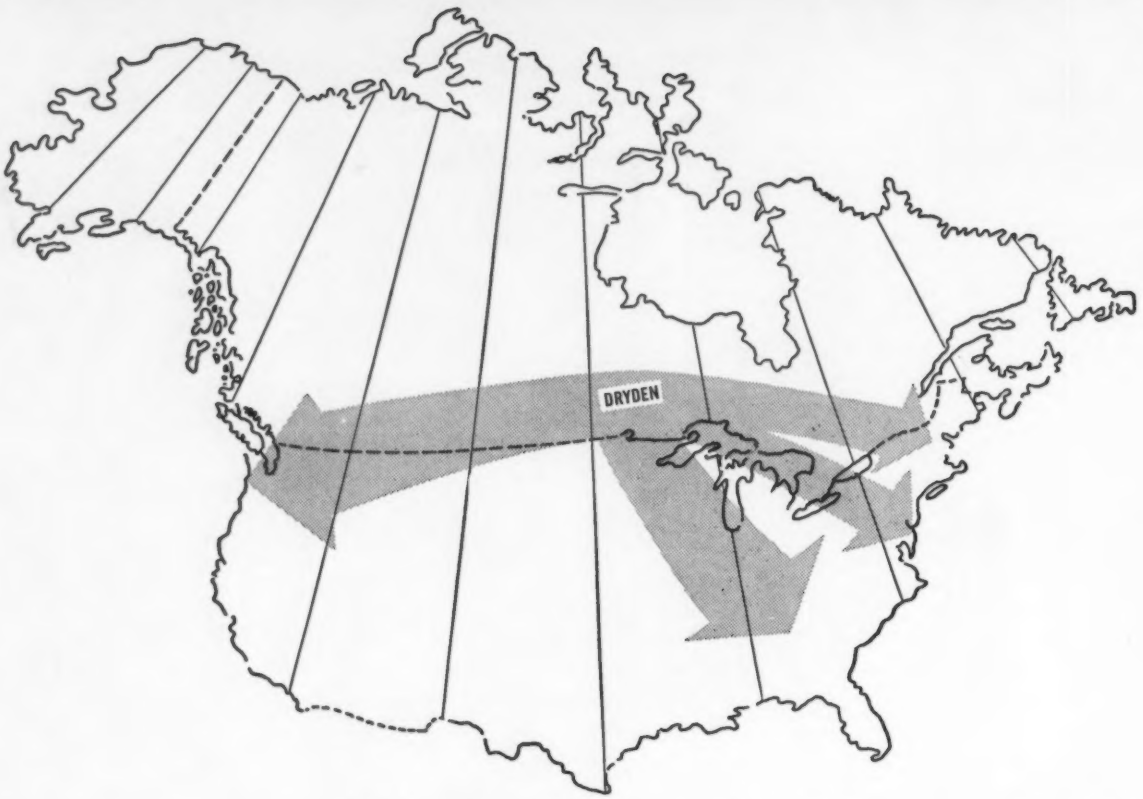
DRYDEN'S LOCATION ASSURES FAST DELIVERY



Dryden has long been known for its efficient Traffic Department...always ready to ship on a few hours' notice. And the shipments get to our customers in record time, because of Dryden's strategic location and proximity to major rail, highway and water routes.

A glance at the map makes it obvious why Dryden can and does make 4-6 day deliveries to the Midwest. But did you know that we also can give the same kind of service to our customers in Eastern United States and Canada? Dryden maintains inventories in boxcars, ready to go at a moment's notice.

Ask your laboratory to compare Dryden Bleached Sulphate with the best quality pulp you know. You, too, will say that it deserves all the endorsements—*and production testimonials*—it now enjoys. Order a trial shipment today. You will be amazed at how quickly you receive it.

DRYDEN PAPER COMPANY, LIMITED
DRYDEN, ONTARIO, CANADA

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SALES REPRESENTATIVES IN THE UNITED STATES:
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New Nalco Coagulant makes Larger, Heavier Floc . . . Faster

Radically different Nalcolyte 110 used with Conventional Chemicals to Cut Costs, Speed Action in Water Clarification

Photo taken in Nalco Laboratories 7 seconds after agitation stopped: *Left*, Control sample of untreated turbid water; *center*, same water, treated with 50 ppm alum; *right*, same water, treated with 20 ppm alum, 1 ppm Nalcolyte 110. Note that large, dense floc is settling out much more rapidly than center alum-treated sample.

Nalcolyte 110 is a new, non-ionic high polymer flocculant of very high molecular weight—over 1,000,000. It is used in extremely small dosages with conventional coagulants (such as sodium aluminate, alum, ferric sulfate) to increase size, density and uniformity of floc.

Less Chemical; Greater Capacity

Action of Nalcolyte 110 in creating heavier, larger, faster-settling floc not only permits greater throughput rates without floc carryover to processing equipment, but also cuts the total chemical requirements at a resultant cost saving.

In the example illustrated above, only 40% as much alum is required when Nalcolyte 110 is used.

May be Used in Potable Waters

Approved by the U. S. Public Health Service Technical Advisory Committee for use in treatment of public water supplies, Nalcolyte 110 gives water works the opportunity to get appreciably greater capacity from existing clarification equipment—at lower treating cost.

High Suspended Solids No Problem

Waters containing high suspended solids respond quickly to Nalcolyte 110 coagulating action . . . frequently without other coagulant chemicals.

Typical high suspended solids waters which can be treated with speed and economy with Nalcolyte 110 are paper mill white water systems, industrial waste waters, mineral slurries and blast furnace gas wash water slurries.

Nalcolyte 110 Easy to Handle

Nalcolyte 110 is a coarse, white, free-flowing powder of non-toxic character. It is fed in dilute water solutions with standard liquid proportioning pumps or feeders. Stock solutions are prepared at concentrations up to 20%. Packaging is in convenient 25-lb. bags.

Data Available Promptly

Full information on Nalcolyte 110 for your coagulant use is ready to be sent upon your request. Write today, or call your Nalco Representative.

National Aluminate Corporation is now

NALCO CHEMICAL COMPANY

6216 West 66th Place • Chicago 38, Illinois

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In Canada—Alchem Limited, Burlington, Ontario

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GUARDITE® ROLLS

smoothest distributor rectifier roll coating ever created by man

So smooth that it is even used to cover stainless rolls, GUARDITE flows around corners of holes and covers any roughness from machining. GUARDITE, because of its outstanding corrosion resistance and long lasting surface, permits more mills to have low cost steel shells coated with this new material. Gone are problems of looseness and the covers peeling-off.

On the machine, you will find GUARDITE performs properly, because its smoothness does not tolerate stock pick-up.

For the new GUARDITE Roll catalog page containing complete technical information, contact your S-W sales engineer, or write to:

STOWE-WOODWARD, INC.

Ask the man from S-W . . .

about the extremely smooth and durable surfaces of Distributor Rolls with GUARDITE covers. Find out about their corrosion resistance; heat resistance, and trouble-free characteristics which put paper money in a paper man's pocket.

GUARDITE IS NEW
and
GUARDITE IS GOOD.

Ask your S-W sales engineer for the technical facts.

S-W INC.

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on the West Coast
HUNTINGTON RUBBER MILLS, INC.
Seattle, Washington
Portland, Oregon
Port Coquitlam, British Columbia, Canada

Trends

Eight Month Total Figures Way Ahead

Paper and board production for January-August, as estimated by APPA totalled 23.7 million tons, an increase of more than 13% above the comparative eight months last year. Paper output at 9.9 million tons was nearly 12% ahead; paperboard at 10.6 million tons was up about 14.5%; construction paper and board near 2.25 million tons showed an increase of over 15.5%.

Newsprint Production Lags Behind Other Grades

Production of newsprint in North America during August 1959 was 8.5% above August 1958. According to the Newsprint Service Bureau, output in the U. S. represented the largest volume of any month on record and a gain over August 1959 amounting to 17.0%. Canadian production showed an increase over August 1958 of 6.0%. Newsprint production in N.A. in the first eight months was 4.4% above the level for the same period of 1958. Cumulative output of U. S. mills at the end of August 1959 was 11.4% more than that produced a year earlier. Canadian production was 2.5% greater than in the first eight months of 1958.

Asphalt Roofing and Siding Show Modest Gains

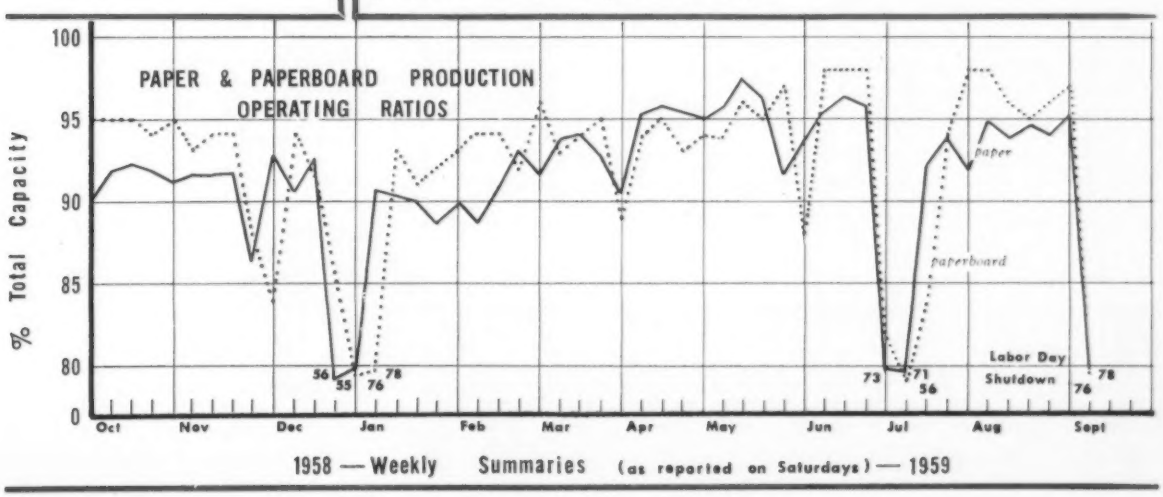
Shipments of asphalt paper and paperboard products show the following comparison of this January-July, (and July in brackets) against last: roofing +3% (+8%), asphalt siding —5% (—2%), insulated siding +1% (—1%), and asphalt board products +26% (—4%).

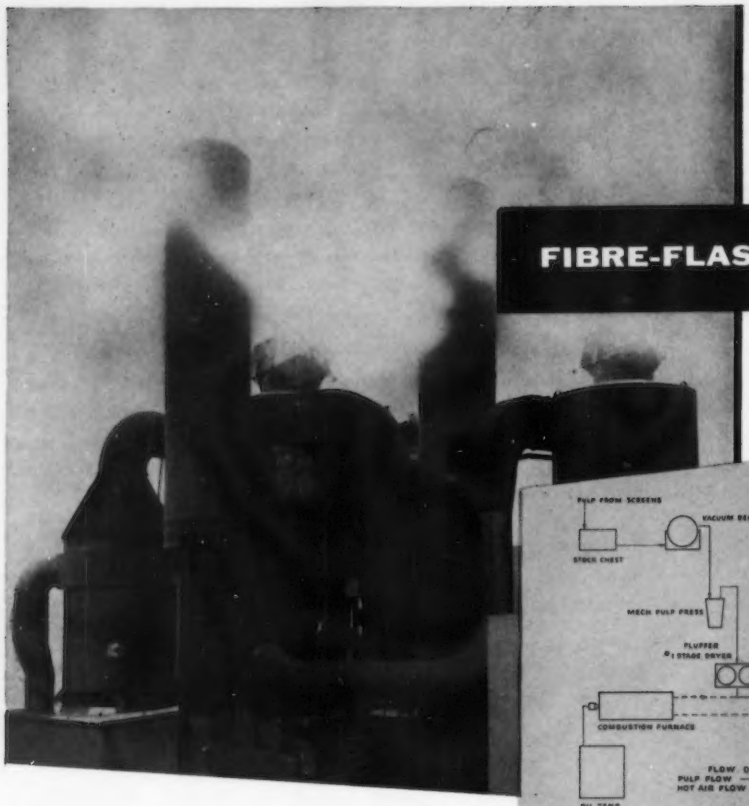
Folding Boxes Show Small Dip in August

Shipments of folding cartons dipped slightly in August, slowing an upward trend experienced since February. The Folding Paper Box Ass'n. of America announced that dollar volume of shipments during August fell 0.8% below the same month last year and tonnage was off 3.3%. Cumulative volume through August of this year holds at 3.5% ahead of the first eight months of 1958. In the same year-to-year comparison, 1959 tonnage shows a 2.4% gain.

Steel Strike Effects Forthcoming Soon

All industry, including our own, will shortly begin to feel serious effects from the steel strike. Automobiles will be first and hardest hit and they are substantial customers of ours. Next we will feel a drop in shipping container demand for products formed from steel. Next many of our equipment manufacturers and mill construction projects will feel the pinch for steel.

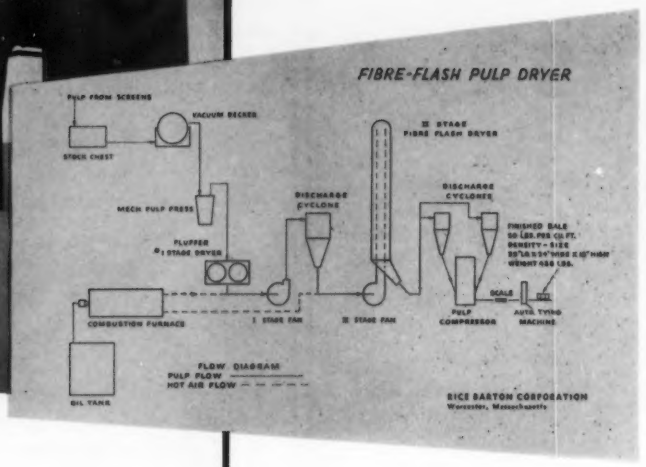




For Pulp Drying . . .

The Rice Barton

FIBRE-FLASH DRYING SYSTEM



The "Fibre-Flash" drying process for use with all types of pulp consists of dewatering the pulp, fiberizing the concentrated pulp material thoroughly to insure uniform drying, evaporation of the fiber-bound water to the required degree of dryness and baling or bulking the material into convenient form for storage or shipment.

The drying medium, either combustion gases or hot air, carries the material to be dried through separate stages of the fiber-suspension-type flash dryer. The relatively high intake temperature flashes-off the surface water and the drying tower provides the necessary time element to permit a complete heat exchange to extract the remaining moisture in the fibers. Drying occurs at high evaporation velocity which maintains a low fiber temperature.

PHOTO COURTESY OF JOHN BREAKEY, LTD.

Minimum capital investment and operating cost.

Peak thermal efficiency.

Reduced labor costs.

Simplicity of equipment with moving parts at a minimum.

Elimination of over-heating or case-hardening effect.

Ease of re-pulping.

RICE BARTON

RICE BARTON CORPORATION

WORCESTER, MASSACHUSETTS, U. S. A.

Paper Machinery Builders Since 1837

PJT | PAPER TRADE JOURNAL

WEEK OF SEPTEMBER 28, 1959

Scott to Share in Stora Nova Scotia Mill

Stora Kopparbergs Bergslags A/B, Falun, Sweden, and Scott Paper Co. are to be the joint owners of the recently-formed Nova Scotia Pulp Ltd., it was announced by Karl Clauson, president of the new company. The common shares are to be held 80 per cent by Stora and 20 per cent by Scott.

Nova Scotia Pulp began construction in July of a new pulp mill on a site located approximately two miles from Port Hawkesbury, Nova Scotia, on the Canso Straits. The mill is scheduled for start-up early in 1962 and will have a capacity of 350 tons of bleached sulphite pulp per day. The firm of Charles T. Main, Inc., Boston, Massachusetts, has been engaged as consulting engineers.

The company has been licensed to use the new two-stage sulphate pulping and liquor recovery process developed by Stora. The company has a long term forest management license covering more than 1,200,000 acres of Crown Forest Lands in Nova Scotia.

Walter Holland, who has been elected vice-president and general manager of the company, will be in charge of the construction of the mill and will assume responsibility for its operation upon completion

The Stora pulping and recovery system was described in detail in an article in the September 7, 1959, issue of PAPER TRADE JOURNAL, based on the editor's inspection of its commercial operation in Sweden.

Clupak Charges Scott Infringes Patent

Clupak, Inc., a company jointly owned by Cluett, Peabody & Co., Inc., and West Virginia Pulp and Paper Co., filed a complaint on September 18 against Scott Paper Co. in the United States District Court, Southern District of Alabama, charging that Scott has infringed and is still infringing Clupak's United States Patent No. 2,624,245 by making, using and selling paper covered by product claims of the patent, and by practicing in the State of Alabama processes covered by claims of the patent.

Clupak's patent covers its process for making extensible paper.

Clupak's complaint asks an injunction against infringement, an accounting and judgment for profits and triple damages arising out of each infringement.

Improvements at Consolidated Paper

The Consolidated Paper Co. of Monroe, Mich., has announced the addition of a new pilot plant to its plastics division research laboratory with an increase in facilities and personnel. Both the lab and the pilot plant are under the supervision of Howard Blandin, who is now engaged in several important development programs.

Greater emphasis on research and development at Consolidated is evidenced by the recent appointment of William Lunsford, promoted from the research department to the position of technical manager of all plant operations. Mr. Lunsford reports directly to C. H. R. Johnson, president, on all matters pertaining to research.

During the past year research personnel has been increased 60 per cent with several additional positions still to be filled.

Plant facilities have been improved at Consolidated by the addition of a new Champlain six color roto press and complete revamping of the 6-B machine press section for finish improvement permitting development in the coating and laminating fields. The Monroe mill has also put into successful operation the Smoothing Press for presskoting to improve printing and bending characteristics of its new Econo-White printing board.

According to Robert Morse, recently appointed manager of manufacturing, research and development at Consolidated has been stepped up to not only create new products, but to improve old ones by quality control, process improvement, increased machine capabilities and instrumentation to accelerate productivity and effect greater manufacturing economies.

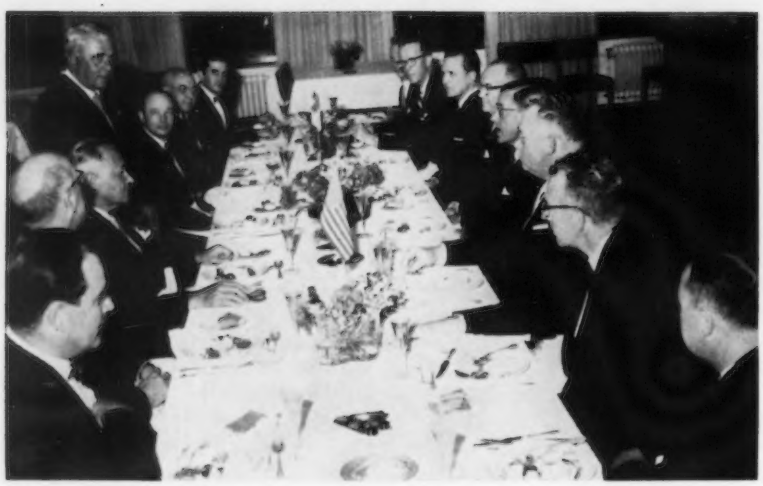
Buckeye Research Yields New Data on Hemicellulose

Increased knowledge concerning the degradation of hemicellulose at high temperatures has been developed at the Buckeye Cellulose Corp. laboratories, according to R. W. Collier, a company research chemist.

Reporting the research at the 136th national meeting of the American Chemical Society in September, Mr. Collier said the findings would be of special interest to the producers of both dissolving and paper pulps. A low hemicellulose level in dissolving pulps is desired by cellulose users, particularly manufacturers of super strength viscose tire cord and cellulose derivatives.

Previously, Mr. Collier explained, it was known that wood hemicelluloses are destroyed by heating in alkaline solutions such as are used in the pulping of wood in the kraft process, and in recent years a mechanism was developed for this reaction. The Buckeye findings present evidence of a new type to support the existing theory of how cellulose and hemicellulose are degraded by hot alkaline solutions.

In addition, the Buckeye project developed reaction rate constants, thus placing the degradation on a quantitative basis. By using the constants, the effect of a given set of processing conditions on the concentration of dissolved hemicellulose can be easily predicted, he said.



THE GROUP of pulp and paper company executives from this country, who are visiting Finland, (See Paper Trade Journal Sept. 7, 1959) were entertained by the Finnish Paper Mills Ass'n. in the Savoy restaurant, Helsinki.

Seated left to right: Heinz Dettmann, The Finnish Paper Mills' Ass'n., Helsingfors; C. G. R. Johnson, vice president Kimberly Clark Corporation., Neenah, Wis.; R. R. Seppala, The Finnish ambassador in the United States, Helsingfors; Holger Nysten (Standing), The Finnish Paper Mills' Ass'n., Helsingfors; Dr. George Sheets, The Mead Corp., Chillicothe, Ohio; E. L. Lamb, vice president, Minnesota & Ontario Paper Co., Minneapolis, Minn.; Nils J. Lindberg, The Finnish Paper Mills' Ass'n., Helsingfors; V. Nykanen, The Finnish Paper Mills' Ass'n., Helsingfors; Dr. Robert March, vice president, Coos Bay Pulp Corp., Scott Paper Co., Everett, Wash.; Kauno Rintakoski, The Finnish Paper Mills' Ass'n., Helsingfors; Richard P. Price, vice president, Hammermill Paper Co., Erie, Pa.; Dr. R. Soderhjelm, managing director of The Central Ass'n. of the Finnish Woodworking Industries, Helsingfors; John H. Heuer, vice president, Great Northern Paper Co., East Millinocket, Me.; Henry W. Fales, vice president, St. Croix Paper Co., Woodland, Me.; Ernest H. Vaissiere, The Madden Corp., New York, N. Y.

East Texas P&P Boiler At Evadale Explodes

On September 14, the No. 2 recovery boiler at the East Texas Pulp & Paper Co. mill exploded, resulting in the death of five employees, from serious to minor injury to 11 others, and major damage to the unit.

The No. 2 boiler was erected in 1958 and was put into operation in February of this year. At that time, the original boiler, which was installed when the mill was built in 1954, was cleaned, repaired and put into "mothballs." Fortunately, this boiler was not damaged by the explosion of the newer one and was brought back into operation within 30 hours. This permitted resumption of normal production in record time.

At this date, cause of the explosion is not known. However, an exhaustive investigation is under way, the results of which will be made known.

Rayonier Canada Retains Sandwell as Engineers

Sandwell and Co., Ltd., have been retained by Rayonier Canada, Ltd. as consulting engineers on the $15,000,000 conversion of its Woodfibre, B. C., operation from bleached sulphite to bleached kraft paper pulp.

Necessary demolition of the old mill will begin immediately as reported in PAPER TRADE JOURNAL, September 14, some buildings and machines, as well as the water storage dam, wood plant, chip bins and power house of the original mill will be retained.

New York City TAPPI 1959-1960 Schedule Announced

Metropolitan District TAPPI, a chapter of Empire State TAPPI, has announced its program of events for the coming season which opened on September 14 at the 465 Club, 465 Lexington Avenue, New York City. There will be four meetings in the fall and four meetings in the winter and spring.

The schedule of dates and programs for each session is as follows:

September 14, 1959—The 1958 Amendment to the Pure Food and Drug Act—How it Affects the Paper Industry.

October 13 — New Web-Forming Devices.

November 10—"What Happens at the Roll Nip."

December 8—Special Problems in the Use of Reclaimed Paper Fibres—A Panel Discussion.

January 12, 1960—High Velocity Drying (Executives Night).

March 8—Coating.

April 12—Packaging.

May 13—Ladies Night.

LATE NEWS FLASH

Allis-Chalmers Buying Valley Iron

Acquisition of the Valley Iron Works Co. by Allis-Chalmers Manufacturing Co. was announced as we go to press. The transaction has been approved by the board of directors of both companies. The change is expected to become effective October 30. Valley Iron Works will operate as a wholly-owned subsidiary under its own name.

Paper and Board Production

According to the American Paper and Pulp Ass'n. the ratio of the United States production to mill capacity for the holiday week ending Sept. 12, 1959, was 78.4 per cent compared with 95.8 per cent revised for the preceding week. The ratio was 92.0 per cent for the corresponding week a year ago.

The paperboard production ratio for the holiday week ending Sept. 12, 1959, was 76 per cent compared with 97 per cent for the preceding week and 97 per cent for the corresponding week a year ago.

(Detailed statistics on page 58)

PAPER PEOPLE

P. T. Sinclair

King Wilkin

C-Z Names Three New Directors

G. E. Young

Three members of Crown Zellerbach's senior management group have been elected to the corporation's board of directors. Named to the board were Peter T. Sinclair, executive vice president, who was also elected a member of the Executive Committee; King Wilkin, vice president for marketing, who was also elected a member of the Executive Committee; and G. E. Young, vice president for newsprint, who was also elected a senior vice president of the company.

Mr. Sinclair has been with Crown Zellerbach since 1928, has served as vice president for manufacturing and converting, and from 1956 until last May was president of Crown Zellerbach Canada, Ltd.

Mr. Wilkin joined the company in 1936, served in various managerial positions with Zellerbach Paper Co. and became president of Zellerbach Paper in 1956. He was named the corporation's vice president for marketing in May of this year.

Mr. Young has been with the corporation since 1925, and served as manager of the Los Angeles office of the coarse paper division. Later he was made sales manager for newsprint and printing paper sales, and in 1941 was elected vice president, newsprint and printing paper sales.

This action by the board fills the vacancies created by the recent deaths of the late Charles Blyth, Henry Mackin and James Schwabacher.

Baumgartner Is T. D. for Tennessee River

John C. Baumgartner, formerly technical director of Georgia Kraft Co., Macon, Georgia, has been appointed technical superintendent of Tennessee River Pulp & Paper Co., Counce, Tennessee, according to an announcement by G. W. E. Nicholson, Tennessee president.

Howe Retires; Strathmore Names New Purchasing Agt.

Everett S. Hallberg has been appointed purchasing agent for Strathmore Paper Co., succeeding Philip D. Howe, who has retired after 46 years with the company.

Mr. Hallberg joined Strathmore in August 1951 as a spare man in the manufacturing department at the No. 2 mill. He held various jobs there until 1954 when he transferred to the warehouse, being assigned to West Springfield in 1956.

Mr. Howe joined Strathmore January 1, 1913, as a helper in the store, becoming a clerk in the purchasing department later that year. During World War I he was in military service for two years. In March, 1924, Mr. Howe became assistant purchasing agent and in 1947 was promoted to purchasing agent.

Fills Post at Sutherland

Sutherland Paper Co. has announced the appointment of Winifred C. Hunter as board mill superintendent. He will be responsible for operations of two of Sutherland's three paperboard mills in Kalamazoo.

A graduate of Kalamazoo College in 1941, Mr. Hunter has been assistant general plant manager of the New Haven Board and Carton Co., New Haven, Conn. He was associated with that company from 1941 until this month.

Bosworth Retires from Chemical Paper

Ralph L. Bosworth, plant engineer for Chemical Fine Paper Co., division of the Standard Packaging Corp. at Holyoke, Mass., has retired after 45 years with the organization. He and Mrs. Bosworth have left for St. Petersburg, Fla., where they will make their permanent home.

Champion Promotes Eight In R&D Department

Promotions and position changes for eight men in The Champion Paper and Fibre Co.'s research and development division have been announced by W. Phalti Lawrence, division director.

Roger Warner has been promoted to manager of the division's engineering department. He replaces Robert Forrest, who, it previously was announced, has been made assistant director of general plant engineering, operations group.

Preston Daneff has been promoted to electrical research and development group leader.

John Teare has been named manager of the division's patent, information and technical services department. He assumes many of the functions formerly held by T. Edward

Knapp, recently named to head Champion's European and licensing division.

Irvan D. Carberry has been named manager of business and personnel administration for the division.

Harold Joiner has been named administrative assistant to the director of research and development.

In addition, a chemical products research group has been established to explore possibilities in the production of chemical raw materials, by-products and new products. Named to this new group were Cornelius Betten, Harold Judd and James Stone.

Mr. Warner, who joined the research department in 1939 as a research engineer after graduation from the University of Dayton, most recently had been assistant manager of the division's engineering department.

Mr. Daneff, a co-op student at the University of Cincinnati, joined the firm full time after being graduated in 1943, worked at the Baldwin-Lima-Hamilton Corp. as an electrical engineer from 1946 to 1955.

Mr. Teare was graduated from the University of New Mexico, received his doctorate degree in physical chemistry from Yale University in 1937. He joined Champion as a research chemist and librarian in 1939 and in 1954 received a degree in law from the Salmon P. Chase School of Law.

Mr. Carberry joined Champion in 1941 and after various jobs in the Ohio Division transferred to research and development in 1947 as supply coordinator. Last January he was promoted to business manager of the research and development division.

Mr. Joiner, a graduate of the University of Cincinnati, joined Champion in 1940 as a chemical engineer. Most recently he has been associate research engineer.

Mr. Betten received both a bachelor's degree in chemistry and a doctorate in chemical engineering from Cornell University. He joined the company as assistant chief chemist in 1937 and became chief chemist in 1945. He also served in the U. S. Navy as an officer during World War II.

Mr. Judd was graduated from Eastern Kentucky State College and took post-graduate work at Marshall College, Huntington, W. Va. He joined Champion in 1955.

Mr. Stone is transferring to the research and development division from the company's operations at Canton, N. C., where he has been employed since 1953 as senior chemist.

G. W. Peters

J. K. Sullins

Mead Promotes Three at Kingsport

Organizational changes at the Kingsport, Tennessee Division of The Mead Corporation have resulted in the promotion of three employees in the technical service department, it was announced by division manager V. K. Shannon.

George W. Peters, technical service director since 1946, has been promoted to the newly created post of technical assistant to the division manager, John K. Sullins has been elevated from assistant to technical service director, and George G. Clark has been named assistant technical service director.

Mr. Peters joined Mead in 1927 shortly after graduation from Emory and Henry College. His 32-year career with Mead has been devoted to various phases of technical service.

Mr. Sullins, who has been assistant technical service director since January, 1958, joined Mead in 1949 following graduation from the University of Tennessee with a degree in chemical engineering. He was assigned to Mead paperboard mills at Harriman and Nashville, Tennessee, and Sylva, North Carolina, before transferring to Kingsport in 1951. He was a member of the engineering staff in the technical service department for six years before his promotion to assistant technical service director.

G. G. Clark

Mr. Clark joined the Kingsport Division as a trainee in 1951. He later was promoted to technical service engineer and has been technical assistant to the general paper mill superintendent since December, 1958.

A. E. H. Fair, president of the Brown Co., who has resigned his position as president and director of the company as his contract has expired.

St. Regis Announces Five Scholarship Award Winners

St. Regis Paper Co. announces the award of its undergraduate scholarship in forestry in the northeastern United States for the academic year 1959-1960 to Lawrence O. Safford, a forestry student at the University of Maine, Orono.

Mr. Safford was chosen by a committee consisting of Hamilton K. Pyles, regional forester, U. S. forest Service, Upper Darby, Pa.; Ralph Marquis, director, Northeast Forest Experiment Station; and Paul M. Dunn, St. Regis director of forestry.

Mr. Safford, a native of Waterville, Me., is a graduate of Waterville High

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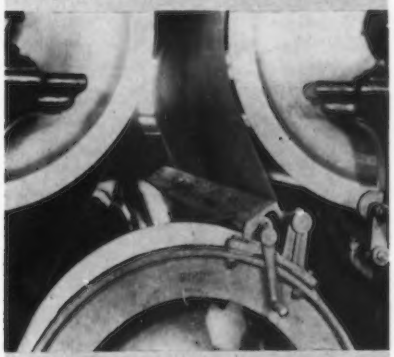

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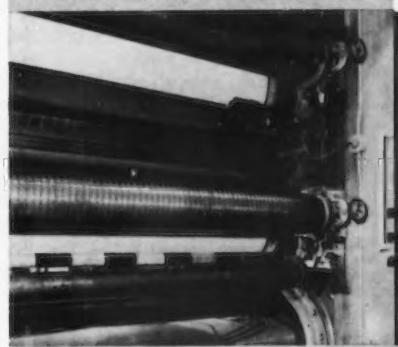

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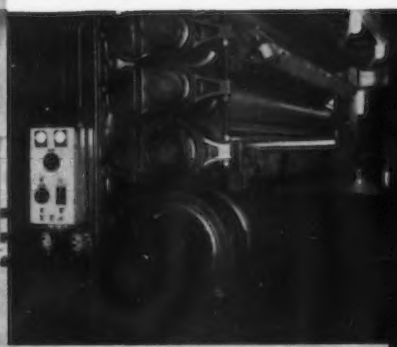

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School. He has been active in forestry research and has been engaged in general forestry work at the University of Maine Forest.

The Northwest award was made to Lawrence E. Goodman, of Oregon State College and the Southern awards to George L. Perry of the University of Georgia; Claflin R. Garst, Jr., University of Florida; and Kenwood C. Nichols, Alabama Polytechnic Institute.

T. N. Knox

Knox Succeeds Gallup, As New York and Penn P.A.

T. N. Knox, has been appointed director of purchases for New York & Pennsylvania Co., Inc. Mr. Knox succeeds C. W. Gallup, who retired June 30 as assistant to the president—purchasing.

Starting at the bottom, Mr. Knox began his business career working in New York and Penn's mills in Pennsylvania and has remained with the company ever since.

Like his successor, Mr. Gallup had spent his entire business career with the same firm. Mr. Gallup was educated at Amherst College and joined the company early 1914 as an employee of its Lock Haven (Pa.) mill.

Executive Changes at Puget Sound

Election of two new officers to fill a vacancy created by the recent death of Harry A. Binzer, former secretary and assistant treasurer, and appointments to several other executive posts in Puget Sound Pulp and Timber Co. were announced by Lawson P. Turcotte, president.

J. Allan Evans, a Puget Pulp employe since 1951, was promoted from assistant secretary to secretary and George K. Boney, in the firm's tax accounting department since 1947, was elected assistant treasurer.

Ralph Roberg, who this year completed 30 years at the pulp mill, will step down as vice president and sales manager but will continue to aid the firm as a sales adviser and as a member of the board of directors.

Two other appointments are of Russell de Lopez, formerly assistant to the vice president for sales, to the post of manager of foreign pulp sales and of Roy Anderson, formerly in sales work, to the post of domestic pulp sales manager.

Eric Ericsson, general superintendent of the mill for the past nine years, has been appointed mill manager. He was graduated from the University of Washington in 1934, majoring in chemical engineering. He joined the firm upon graduation and was technical director for many years.

Kraske Appointed Planning Co-ordinator

W. A. Kraske has been appointed planning co ordinator according to a recent announcement made by T. N. Baupré, president of Columbia Cellulose Co., Ltd., and Celgar, Ltd.

"Recent corporate changes within our organization," said Mr. Baupré, "emphasize the growing importance of planning for future development. The planning co-ordinator will assist

W. A. Kraske

our management committee in investigating and scheduling studies which appear to offer promise."

Mr. Kraske graduated from the University of Wisconsin in chemical engineering in 1944. He has been employed by the Institute of Paper Chemistry, the Gould Paper Co., the U.S. Forest Products Laboratory, Scott Paper, Allied Chemical Corp. and the Development Department of Celanese Corp. of America.

Since 1956, Mr. Kraske has been staff process engineer for Columbia Cellulose and Celgar and will still be available to assist in this capacity in connection with current problems.

Ass't Manager of Waste Paper Council Appointed

George A. Graham has been appointed assistant manager of the Waste Paper Utilization Council, effective October 1, 1959, according to announcement by Ralph W. Kumler, manager of the Council. Mr. Graham's services will enable the Council to broaden and intensify its program of promoting the use of waste paper

G. A. Graham

in the paper and board industry by improving its quality. Mr. Graham comes to the council from the Institute of Paper Chemistry, Appleton, Wisconsin, where for twelve years he has been administrative co-ordinator.

Mead Subsidiary Announces Two Promotions

Appointment of J. W. McVicker as assistant to the president and the transfer and promotion of E. C. Becker to purchasing agent was announced recently by N. A. Seidensticker, president, Chillicothe Paper Co.

Mr. McVicker was purchasing agent and traffic manager prior to this promotion. Mr. Becker was purchasing assistant of The Mead Corp.'s Chillicothe Division before transferring to Chillicothe Paper Co., a Mead wholly owned subsidiary.

This promotion for Mr. McVicker highlights a 23-year career with Chillicothe Paper Co. Starting in the laboratory in May, 1936, he steadily advanced to positions of greater responsibility in sales, scheduling, traffic, and purchasing. In his new position, Mr. McVicker will have supervision of the sales office, scheduling department, and traffic department.

Mr. Becker began his career with Mead as a purchasing trainee at the Chillicothe Division in May, 1955.

R. H. Bernstein

E. D. Cann

Bernstein and Cann Join Chas. T. Main

Ralph H. Bernstein has recently joined the pulp and paper group of Chas. T. Main, Inc. as a member of the engineering staff. Prior to his affiliation with Chas. T. Main, Inc. Mr. Bernstein was with New Haven Board and Carton Co., of New Haven, Conn., serving as plant engineer. Before this he was consulting architect and engineer at Westcott and Mapes, Inc. of New Haven, Conn.

A graduate of Yale University in 1945 (B.E.) Mr. Bernstein continued his graduate work at the University of Buffalo and subsequently at Brooklyn Polytechnic Institute.

Everett D. Cann has also joined the pulp and paper group of Chas. T. Main. Prior to his present position in pulp and paper production studies Mr. Cann was with the research department of the Hudson Pulp and Paper Corp. at Palatka, Florida. Before this he was assistant superintendent of technical services at the St. Lawrence Paper Corp., Three Rivers, Quebec.

After graduating from McGill University in 1939 Mr. Cann continued his education at the University of New Hampshire and was granted his M.Sc. in 1941. Returning to McGill he received a Ph.D. in 1946.

J. W. Hemphill

R. F. Kist

Hemphill Joins Singmaster & Breyer

J. W. Hemphill, formerly of the Johns-Manville Sales Corp. and of Carthage Machine Co., has joined the sales staff of Singmaster & Breyer, Inc., New York chemical process and metallurgical engineers, as a pulp and paper specialist.

This marks Singmaster & Breyer's entry into the pulp and paper field as consultant engineers and contractors. The firm is an affiliate of The Flour Corp., Ltd., Los Angeles.

New Position for Kist at Perkins-Goodwin

Louis Calder, Jr., president of Perkins-Goodwin Co., announces the appointment of R. F. Kist to the newly created position of service manager—pulp sales.

Mr. Kist joined the Perkins-Goodwin organization on December 6, 1932. He was appointed traffic manager in 1947, and will continue to hold that position in addition to his new duties.

As service manager—pulp sales, he will be responsible for order processing and expediting, statistical control, and collection and dissemination of information affecting pulp sales.

Two Bergstrom Employees Receive Bolton Awards

Bergstrom Paper Co., Neenah, Wis., was well represented in the 12th annual Bolton Award Essay Contest with Miss Jacqueline Fandrey, personnel secretary, winning the third prize award of $500 and George C. Sisler, assistant paper mill superintendent, one of seven prize winners receiving $200 awards.

Presentation of the awards to Miss Fandrey and Mr. Sisler was made by John G. Bolton, President of John W. Bolton & Sons, Inc., Lawrence, Mass., at a special ceremony with N. H. Bergstrom, president of Bergstrom Paper Co., in attendance.

L. to r. are: John G. Bolton, Jacqueline Fandrey, George C. Sisler, and N. H. Bergstrom.

Weyerhaeuser Names Mgr. For Delair Board Mill

Appointment of Erskine C. Ingram of Everett, Wash., as manager of Weyerhaeuser Co.'s paperboard mill at Delair, N. J., has been announced by H. W. Morgan, vice president.

Mr. Ingram has been serving as assistant superintendent of the company's Everett sulphite mill. He replaces Stuart B. Clark, who will retire as manager and vice president of the former Kieckhefer-Eddy division.

Beginning as a project chemist at Weyerhaeuser's Longview, Wash. pulp mill, Mr. Ingram later held supervisory posts there and at Everett.

The Delair mill is under the direction of C. H. Carpenter, vice president for eastern sales of Weyerhaeuser's shipping container division.

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Modern Methods of Mechanical Pulp Manufacture

This book comprehensively covers all aspects of groundwood pulp production. The author, K. H. Klemm, has a broad knowledge of groundwood manufacturing methods and has been associated with groundwood mills on both sides of the Atlantic. Price: $5.00.

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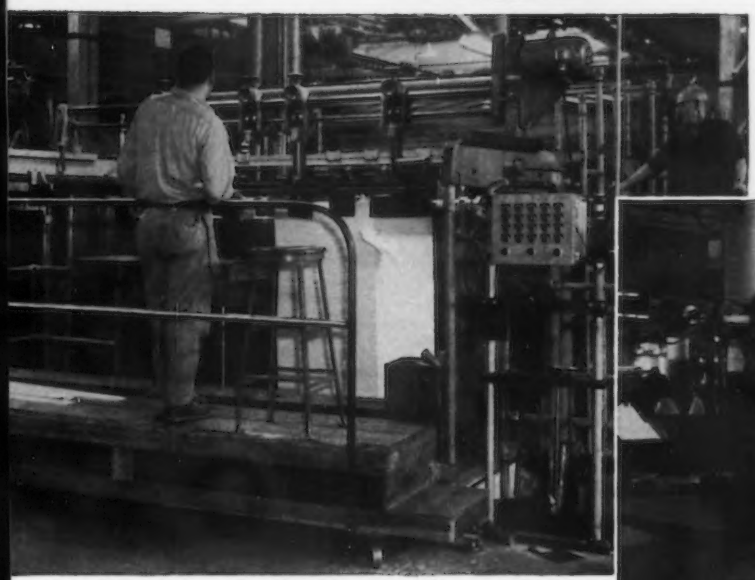

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Recognizing the value of Cutter-Pilers designed to fit their own specialized sheeting problems, KVP turned to Clark-Aiken, an acknowledged leader in the manufacture of paper mill machinery for more than a century. Now the heart of KVP's finishing room is Clark-Aiken equipment designed to fit these specific requirements.

If your finishing room production is lagging, why not follow the example of KVP by placing your problem in the competent hands of trained Clark-Aiken engineers. An exhaustive study of your operations and plant conditions will bring qualified recommendations on the production equipment best suited to your needs.

And because Clark-Aiken engineers are thoroughly schooled in the techniques of practical finishing room automation their recommendations encompass more than merely suggesting the right machine for the right job. They will detail a plan of integrated automation that will help you realize the full potential of your finishing room. This includes recommending or designing and supervising installation of special machines and materials handling equipment all engineered around the high speed accuracy of the Clark-Aiken Cutter-Piler.

Consult Clark-Aiken for the right answer to your sheeting problems—you'll get *Qualified Recommendations, Skilled Engineering, Top Quality Equipment, Practical Finishing Room Automation and Greater Production.*

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The Black-Clawson Company, Inc.,
Paper Machine Division,
Watertown, New York

With the improvements over the past few years in other methods of power transmission, the old reliable flat belt drive had been on the decline. This was basically due to two conditions; namely, the limited horsepower capacity and the poor speed regulation. The development of the nylon core belt has completely changed this situation so that today applications of flat belt drives are being made to conditions which would have been impossible five years ago.

The advent of the nylon core belt with its higher horsepower ratings and extremely high belt speeds has necessitated considerable changes in the design and application of flat belt drives.

In order to utilize the potentialities of these belts, it has been necessary to extend the horsepower capacity of the spiral bevel drives, build pulleys which are capable of withstanding these high speeds, and use various methods of clutching, so as to keep the clutch velocities within reasonable limits.

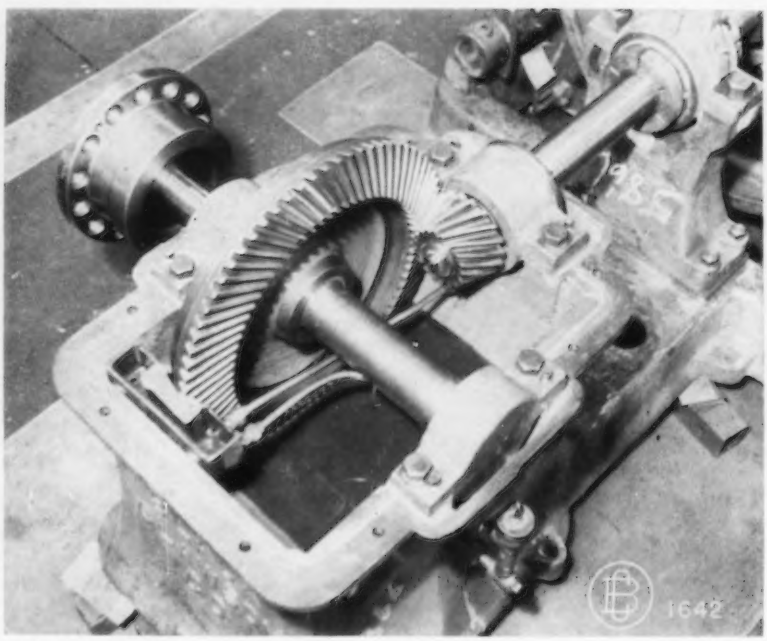

Figure 1. Cut-off drive stand with spiral bevel gears compounded with helical gears.

Trends in Drive Stands

Recently the trend in drive stands has been to use not only the well known quill type drive, but also the cut-off type drive. These cut-off drives have taken two forms; one with the clutch on the high speed shaft and one with the clutch on the low speed output shaft.

Most of the drive stands now being produced have spiral bevel gears, and may be further compounded with helical gears, depending upon the application. This drive stand is extremely simple and rugged in construction as shown in Figure 1. The short pinion shaft is extended so as to be able to mount a cut-off type clutch and has all the necessary self-contained bearings to withstand the loads imposed by the clutch and the spiral bevel pinion. If it is necessary to make reductions greater than 5 to 1 or if some very special reduction is needed, a further compound train can be added, the pinion of which is mounted on the same shaft as the spiral gear.

Lubrication of this type of drive is extremely simple. The spiral bevel gear dips in oil, carrying a certain amount with it, and this is scraped off and allowed to flow, by gravity, to all necessary bearing points. As the speed of the drive increases, more oil is available for lubrication, which makes for a very reliable operation.

With the cut-off type drive, using a clutch on the high speed shaft, (see Figure 2), a separate pulley stand is used, which has a drilled shaft for the introduction of air into the clutch. With this type of an arrangement, a great deal of flexibility is achieved, as the drive can be lengthened considerably to get around obstructions. Also where large draw rates are required, the face of the pulley may be extended to considerable lengths. The main disadvantage of this arrangement is, where space is at a premium, it is not as compact as a quill type drive.

When the clutch is to be mounted on the output shaft of the drive stand, it is not necessary to drill the pulley shaft. (see Figure 3). The output gear shaft must be drilled through, so that air can be introduced into the cut-off type clutch.

With the clutch placed on the drive-in shaft, we can use the quill type drive arrangement, but with the pulley attached directly to the shaft. This method leads to a more compact unit, where space is at a premi-

um. As shown on the picture, this type of drive can have the pulley stand base cast integral with the drive stand proper, doing away with the necessity of aligning two separate pieces.

With either of these types of drives, inching forward and reverse, and slack take-up functions can be installed. Where only inching forward is required, an over-running clutch can be utilized, so that no engaging and disengaging is required. If inching reverse is also required, a standard type clutch can be connected with this inching device for rotation in either direction, or we can use lever engagement of gears.

The slack take-up feature is incorporated in the belt shifter. It consists of an air cylinder which will shift the complete belt shifter assembly to a slightly higher temporary speed and, when released, will return to the same original draw rate. This temporary speed increase is usually about one per cent.

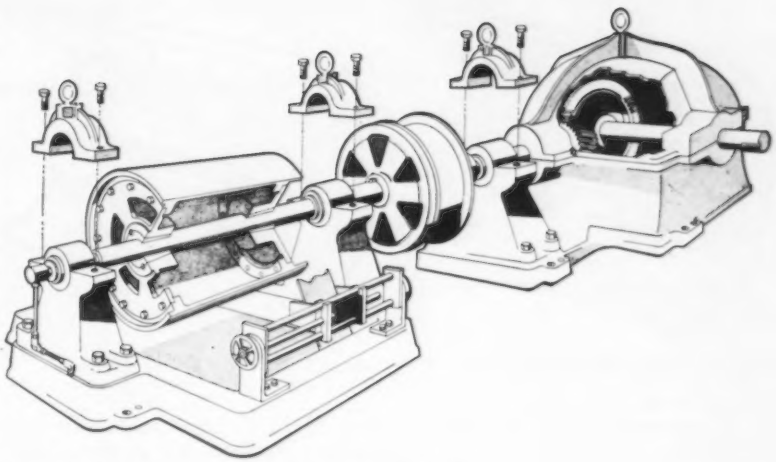

Figure 2. Cut-off drive with clutch on the pinion shaft.

Clutch Developments

Almost every new drive made is equipped with air operated clutches. These clutches can either be of the radial type, such as made by Fawick, or can be of the disk type providing accurate alignment is maintained. Until recently, the radial type clutch had distinct advantages in its heat dissipation; however, with the advent of the new "Cerametalic" disk elements, the heat dissipation, from disk clutches, has been improved considerably.

In the application of these clutches, it is necessary to consider two factors. First of all is the peripheral speed, which is very important in the radial engaging clutch. Second, is the heat dissipation capacity of the clutch. The problem of peripheral velocity has become very acute with the higher speeds used in conjunction with the nylon core belts and frequently speeds as high as 700 to 800 r.p.m. are encountered. When this great speed is also aggravated by high horsepower conditions, it is very difficult to keep the peripheral velocity of the clutches within a reasonable figure. In order to overcome this difficulty, we can utilize dual clutch elements, which tends to keep the drum diameters at a minimum.

It is for this reason that many clutches are now being installed on the output of the gear unit. The lower speeds involved make velocity problems completely disappear, and larger size clutches can be installed. Additional benefits are also obtained, in that the heat dissipation quantities involved are identical, regardless of where the clutch is located. With the larger size clutches required on the low speed shafts, the additional heat capacity available is a great help in increasing clutch life.

New Pulley Designs

With the speeds normally encountered, when using leather belts, there is no problem experienced with the pulleys. However, with the nylon core belts, special pulley construction must be used to achieve the higher velocities desirable. Pulleys can be supplied with split hubs and with rims split between the arms (see Figure 4) or through the arms (see Figure 5). If desired, solid pulleys may also be used. The split between the arm pulleys should not be used over 5000 f.p.m. At higher velocities, up to about 6000 f.p.m., a split arm pulley may be used but, above these speeds, solid rim pulleys are a must (see Figure 6). When solid rim pulleys are used they are usually provided with taper lock bushings in order to facilitate mounting.

It is also necessary to utilize higher strength materials in these pulleys. One of the materials which

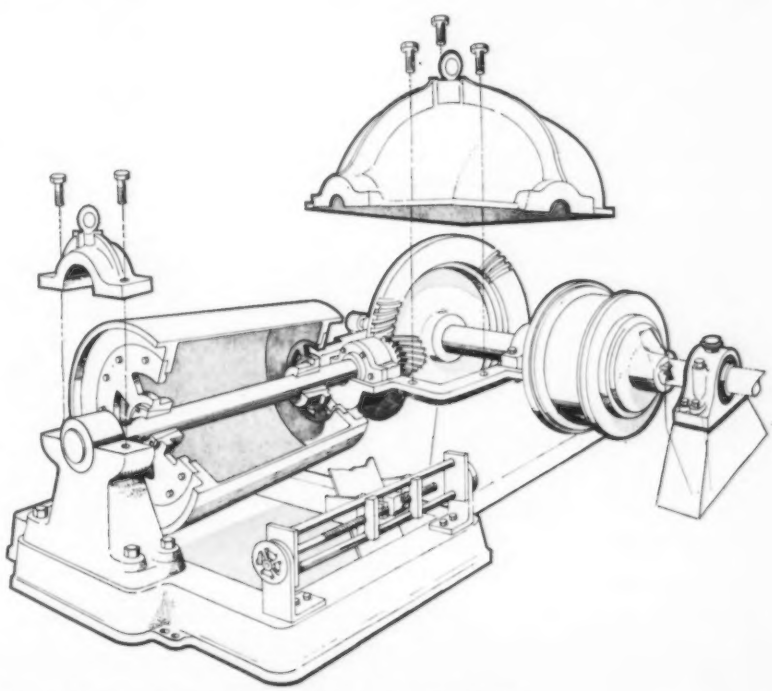

Figure 3. Integral drive stand with clutch on out-put shaft.

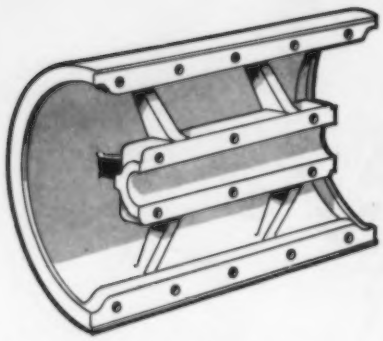

Figure 4. Pulley split between arms.

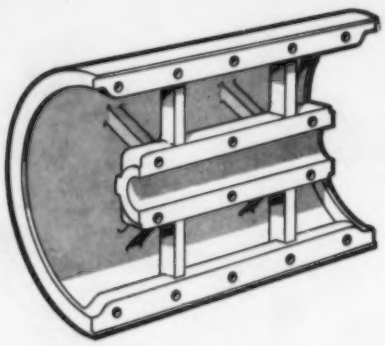

Figure 5. Pulley split through arms.

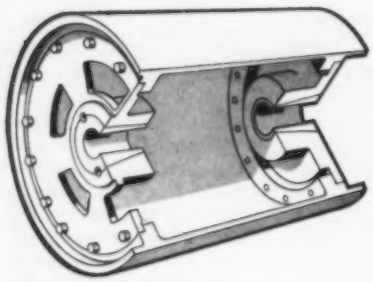

Figure 6. Pulley with solid rim.

is extremely useful is BlaCaloy iron. With this material, it is possible to achieve peripheral velocities of up to 9000 f.p.m. A typical design of a solid rim pulley is as shown in Figure 6, you will note that the pulley shell is constructed similar to a dryer shell. Heads are bolted into the shell and they contain provisions for inserting the taper lock bushings.

Selection of the proper taper for the pulleys is very important, as excessive taper will reduce the drive efficiency. This taper is affected by the belt width and as a general rule must be smaller than for leather belts. As a rule of thumb, the taper for a nylon belt will be in the vicinity of ⅔ of the taper for leather belts of equal width, but it is necessary that each application be examined individually, on its own merits, to definitely establish the maximum permissible taper. This reduction of degree of taper is not as serious as it first appears, as the reduced draw rate, with a given face pulley, is partially compensated by the reduced width of belt, which gives a greater usable active face.

Nylon Belts Key

As the power required for larger and faster machines increased, the size of the leather belts required was so extremely wide that the belts became unstable, and would not track properly. This manifested itself into speed variations, which were large enough to be easily visible, and resulted in many paper breaks. Speed fluctuations were further aggravated by the fact that leather is a heterogeneous material, so that as loads were applied, the resulting strains were not always equal over the whole belt width. As a result, the belt developed a kink with consequent variations in tracking, as this out of line area contacted the pulleys.

On the other hand, nylon is a homogeneous material, and since the leather facing does not support any of the tensile load, when strains are placed in the belt, it stretches evenly. This, coupled with the higher horsepower rating, with consequent reduction in width, produces a much more stable running belt.

The physical properties of a nylon belt are also much better. The modulus of elasticity is 78,000 p.s.i. which is as much as four times that of leather. The elastic limit is about 8600 p.s.i., which again is about four times that of leather. Even more difference is seen in the ultimate strength, which is 5 to 6 times as great.

However, the difference which means the most to the user is that the nylon is truly elastic and does not exhibit the tendency toward inelastic deformation, which is inherent in all leather. It is for this reason, that continued take up is unnecessary and when installed properly, can run for years without retensioning. One of the benefits achieved by this property is reduced bearing loads. When this belt is installed, it is tensioned to perform the job. With leather belts, there is a great tendency to overtighten the belts in order to lengthen the time before retightening is necessary. This results in extremely high bearing loads before the belt stretches to a normal tension.

The specific weight of the nylon belt is considerably under that of leather. For instance, a 3.6 m.m. belt, the heaviest made, weighs about 1.8 lbs. per sq. ft. A triple ply heavy leather belt weighs about 3 lbs. per sq. ft. Because of this weight advantage, coupled with the higher modulus of elasticity, the effects of centrifugal force are not nearly as severe. This is one of the reasons why higher belt speeds can be utilized.

The installation of these nylon type belts has a very important factor upon their behavior, not only as to load carrying capacity, but it also effects the overload capacity. The amount of initial tension which is put into the belt during installation varies, but usually is between three and four per cent. Three per cent is used for the lighter type drives, such as presses, while 3½ per cent would be installed on dryer sections and calenders. In the case of a particular severe operation where a high inertia and/or shock loads will be encountered frequently, the belt should be tensioned with 4 per cent elongation.

If the belt were stretched 3 per cent, a load of 248 lbs. per inch of width would be developed within a 2.7 m.m. thick belt. As horsepower is applied to this drive, the tight side tension increases from the initial load and at the same time an equal amount of load is removed from the slack side. If we were to load this belt up to its maximum catalog rating, it would be found that approximately 81 lbs. of additional load would be put onto the tight side and 81 lbs. load would be subtracted from the slack side. This makes the tension ratio of the tight side tension divided by the slack side tension of about 1.97:1. However, because of the extremely high coefficient of friction of this belt facing material, a tension ratio of up to 9 to 1 can be realized. This means that the tight side tension can actually be increased to 450 lbs. and the slack side tension reduced to 50 lbs., and we would have a 97 per cent overload factor before the belt would begin to slip. The high tension ratio possible, is another reason why this belt helps reduce bearing loads, as the belt does not have to be overtightened to prevent slip during overload condition.

If this initial tension were increased to 4 per cent elongation, equivalent to a load of 332 lbs. per inch, the tight side tension could be as much as 594 lbs. and the slack side tension reduced to 66 lbs., without exceeding the 9 to 1 tension ratio. Under this condition we can now get as high as a 327 per cent

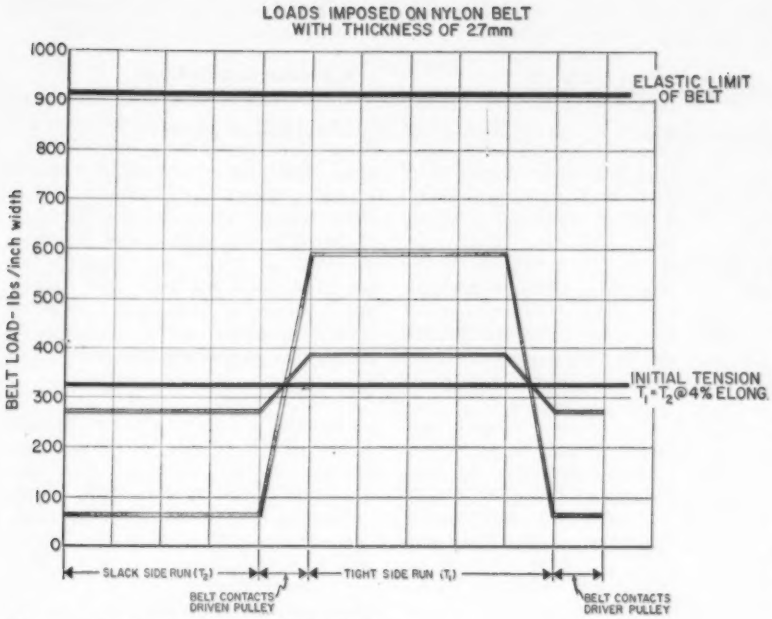

Figure 7. Overload capacity of Nylon belts.

overload factor before any slippage will occur.

In designing one of these belt drives, the TAPPI recommended drive capacity horsepower is used and the horsepower calculated by this method is then divided by the allowable catalog rating of the belt. This procedure gives, on an average, a 50 per cent stronger belt than is actually needed, based on the normal running load of the machine part. Therefore, the overload capacity, based upon running load, is even greater, and is approximately five times running horsepower (see Figure 7).

Since the horsepowers given by the catalog data limits the stress, due to the difference between the tight and slack side tension, to 1560 lbs. per sq. inch, it is now possible to calculate what the theoretical regulation of this drive would be. As previously described, the belt is first applied with an initial tension and the running horsepower both adds and subtracts equally from this initial tension value. This means that the elongation of two per cent, which is developed by stressing to 1560 lbs. per sq. inch, can actually be divided in half, since we are varying equally both sides of a neutral position. If we also add the factor of approximately 50 per cent over design, due to using the recommended drive capacity factor, the theoretical regulation between zero and full load is approximately 0.67 per cent.

We have now covered the features and limitations of each of the various components required to make a drive. Now, let us examine them as a unit to be applied to a given condition.

Application of Recent Developments

When drives are being designed for a new machine, the only information which we have initially is the horsepower required and the drive-in shaft speed. Due to the versatility of the belting material, the drive could be made either as long or short center drive. With only this amount of information, the drive could be designed with an infinite number of variations. It is here where experience is necessary, so that a well-balanced and economical system will be evolved.

We shall now follow along the sequence of operations necessary to make the proper selections.

1. Set Approximate Ratios

Since we know the exact output speed required, the desired ratio speed required, the desired ratio can easily be determined which will give a pinion speed in the range of 500 to 700 r.p.m. This range of input speeds is sufficiently high to afford an economical drive size, but is not so high as to run into trouble with high gear velocities, or limit clutch selections too drastically.

2. Select Drive Size and Exact Ratio

Once we know the approximate pinion speed, the actual horsepower

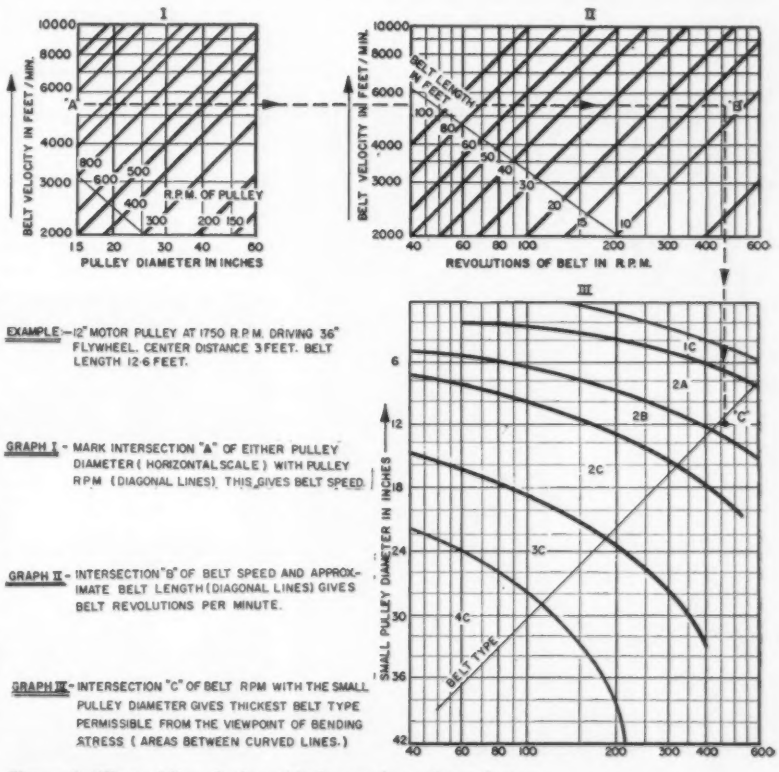

Figure 8. Effect of line shaft and belt speeds on drive design.

rating selection can be made. The required horsepower is proportioned to standard speed ratings and selection tables are used. If the speed is such as to require a compound reduction, it is necessary to make one approximating selection, first, as the various size drives may not all have exactly the same ratios.

It is at this time that certain variations may occur in selection of drive sizes. Frequently, on strictly a horsepower selection, a large number of different drive sizes and ratios may be indicated. In fact, no two drives may be alike. However, by grouping similar units together, the number of different units may be drastically reduced. This is a very important feature which helps keep spare parts inventories at a reasonable level and if required, permits whole units to be interchanged.

3. Clutch Selection

Assuming we know what make of clutch is to be used, the torque capacity may now be calculated. Suitable factors, mainly based upon experience, are applied. Also, the maximum desired air pressures are set. Once the clutch is selected, a check on the peripheral velocity is made, and if it is within prescribed limits the problem is solved. However, if the velocities are too high, various decisions may be made, such as going to multiple or wide face units, placing the clutch on a low speed shaft, or reducing the pinion speed.

4. Line shaft and Belt Speeds

If the ratios have allowed all the pinion speeds to be within close limits, the selection of a lineshaft speed is relatively easy. Almost any speed, which will give reasonable ratios and pulley diameters, can be used.

If, due to circumstances, the above is not true, various compromises must be made. It must be remembered that with higher speeds, the size of the components of the lineshaft, and cost, is reduced. However, as r.p.m. is increased, the diameter of the pulleys must be reduced in order to keep a given belt velocity. With small pulleys at high speed, the maximum permissible belt thickness is reduced and consequently the belt width becomes greater.

Also coming into the picture at this time is the effect of belt r.p.m. (see Figure 8). Since nylon is an elastic material, it has a definite fatigue strength and tends to fail in flexure. Therefore, as the number of cycles per unit time increases, the severity of the stresses must be reduced in order to maintain a minimum acceptable life. Therefore, we have an additional limitation coming into the selection. Also we can see that as the belt length is decreased, for short center drives, the problem of belt r.p.m. becomes more acute.

5. Checking the Drive Layout

Once the drive has been calculated to this point, it is necessary to make dimension checks to avoid interferences. Such things as, will the clutch fit into the pulley on a quill type drive, or is the pulley too large to fit between the stand rails, must be checked. If trouble is encountered, we must then go back and change such things as lineshaft speed or pulley diameter or in particularly difficult cases perhaps the drive ratio.

6. Belt Selection

The belt is now a very simple matter to select, (Table I), as we have already set the thickness, speed and any application factors. The horsepower per inch of width can be taken from the published tables and when this value is divided into the R.D.C. horsepower, the required width is determined. This width then determines the permissible pulley taper.

Many installations of this type have been made and have proven to be highly successful. A typical long center drive is shown in Figure 9 and a short center drive in Figure 10. Machines up to 265 inches wide at speeds up to 2000 f.p.m. have been proposed using this type drive. This indicates that the flat belt drive does have a good future.

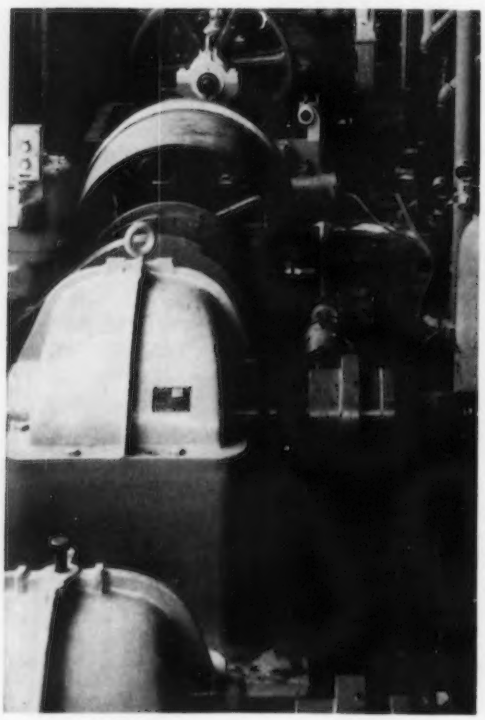

Figure 9. Typical long center drive.

Figure 10. Installation of a short center drive.

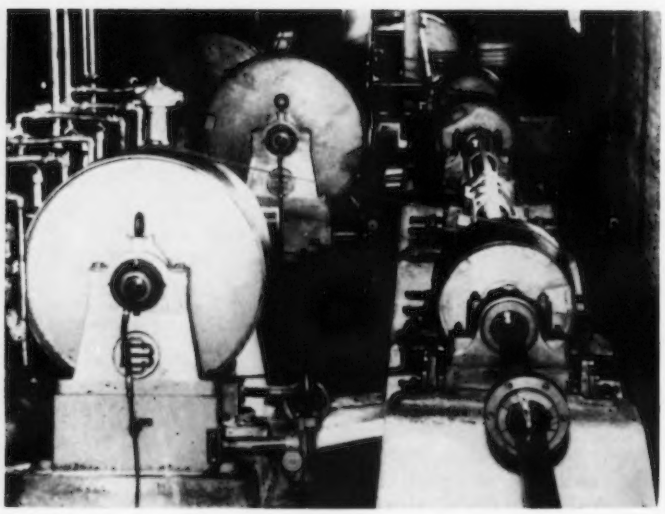

TABLE I

Horsepower per Inch of Width for Extremultus Belts

BELT SPEED Ft./min.	1A	1B	1C	2A	2B	2C	3C	4C
100	.09	.13	.17	.18	.26	.33	.50	.86
200	.19	.26	.33	.37	.52	.66	.99	1.32
300	.28	.40	.50	.55	.78	.99	1.49	1.99
400	.38	.53	.66	.74	1.04	1.32	1.99	2.64
500	.47	.66	.83	.92	1.30	1.65	2.48	3.31
600	.57	.79	.99	1.11	1.56	1.98	2.98	3.97
700	.66	.93	1.16	1.29	1.82	2.31	3.47	4.63
800	.76	1.06	1.32	1.47	2.08	2.64	3.96	5.29
900	.85	1.19	1.49	1.66	2.34	2.97	4.47	5.96
1000	.94	1.32	1.65	1.84	2.59	3.30	4.95	6.60
1100	1.04	1.45	1.81	2.02	2.85	3.63	5.44	7.25
1200	1.13	1.58	1.98	2.20	3.10	3.95	5.93	7.90
1300	1.22	1.71	2.14	2.38	3.36	4.28	6.41	8.55
1400	1.32	1.84	2.30	2.56	3.61	4.60	6.90	9.20
1500	1.41	1.97	2.47	2.75	3.87	4.93	7.39	9.86
1600	1.51	2.10	2.63	2.93	4.13	5.26	7.88	10.5
1700	1.60	2.23	2.79	3.11	4.38	5.58	8.37	11.2
1800	1.69	2.36	2.95	3.29	4.64	5.91	8.85	11.8
1900	1.78	2.49	3.12	3.47	4.89	6.23	9.34	12.5
2000	1.87	2.62	3.28	3.65	5.15	6.56	9.83	13.1
2100	1.97	2.75	3.44	3.83	5.40	6.88	10.3	13.7
2200	2.06	2.87	3.60	4.00	5.65	7.19	10.8	14.4
2300	2.15	3.00	3.75	4.18	5.89	7.51	11.3	15.0
2400	2.24	3.13	3.91	4.35	6.14	7.82	11.7	15.6
2500	2.33	3.26	4.07	4.53	6.39	8.14	12.2	16.3

BELT SPEED Ft./min.	1A	1B	1C	2A	2B	2C	3C	4C
2600	2.42	3.38	4.23	4.71	6.64	8.46	12.7	16.9
2700	2.51	3.51	4.39	4.88	6.89	8.77	13.2	17.5
2800	2.60	3.64	4.54	5.06	7.13	9.09	13.6	18.2
2900	2.69	3.76	4.70	5.23	7.38	9.40	14.1	18.8
3000	2.78	3.89	4.86	5.41	7.63	9.72	14.6	19.4
3100	2.87	4.01	5.01	5.58	7.87	10.0	15.0	20.0
3200	2.96	4.13	5.16	5.75	8.10	10.3	15.5	20.6
3300	3.04	4.25	5.31	5.91	8.34	10.6	15.9	21.2
3400	3.13	4.37	5.46	6.08	8.58	10.9	16.4	21.9
3500	3.22	4.49	5.62	6.25	8.82	11.2	16.8	22.5
3600	3.30	4.61	5.77	6.42	9.05	11.5	17.3	23.1
3700	3.39	4.73	5.92	6.59	9.29	11.8	17.7	23.6
3800	3.47	4.85	6.07	6.75	9.53	12.1	18.2	24.3
3900	3.56	4.97	6.22	6.92	9.76	12.4	18.7	24.9
4000	3.64	5.09	6.37	7.09	10.0	12.7	19.1	25.5
4100	3.72	5.20	6.51	7.25	10.2	13.0	19.5	26.0
4200	3.80	5.32	6.65	7.41	10.5	13.3	20.0	26.6
4300	3.88	5.43	6.79	7.56	10.7	13.6	20.4	27.2
4400	3.96	5.55	6.93	7.72	10.9	13.9	20.8	27.7
4500	4.05	5.66	7.08	7.88	11.1	14.2	21.2	28.3
4600	4.13	5.77	7.22	8.04	11.3	14.4	21.6	28.9
4700	4.21	5.89	7.36	8.20	11.6	14.7	22.1	29.4
4800	4.29	6.00	7.50	8.35	11.8	15.0	22.5	30.0
4900	4.37	6.12	7.64	8.51	12.0	15.3	22.9	30.6
5000	4.45	6.23	7.78	8.67	12.2	15.6	23.3	31.1

BELT SPEED Ft./min.	1A	1B	1C	2A	2B	2C	3C	4C
5100	4.52	6.33	7.91	8.82	12.4	15.8	23.7	31.7
5200	4.60	6.44	8.04	8.96	12.6	16.1	24.1	32.2
5300	4.67	6.54	8.17	9.11	12.8	16.3	24.5	32.7
5400	4.75	6.64	8.30	9.25	13.1	16.6	24.9	33.2
5500	4.82	6.75	8.43	9.40	13.3	16.9	25.3	33.7
5600	4.89	6.85	8.56	9.54	13.5	17.1	25.7	34.2
5700	4.97	6.95	8.69	9.69	13.7	17.4	26.1	34.8
5800	5.04	7.05	8.82	9.83	13.9	17.6	26.5	35.3
5900	5.12	7.16	8.95	9.98	14.1	17.9	26.9	35.8
6000	5.19	7.26	9.08	10.1	14.3	18.2	27.2	36.3
6100	5.26	7.35	9.20	10.3	14.5	18.4	27.6	36.8
6200	5.32	7.45	9.31	10.4	14.6	18.6	27.9	37.2
6300	5.39	7.54	9.43	10.5	14.8	18.9	28.3	37.7
6400	5.45	7.63	9.54	10.6	15.0	19.1	28.6	38.2
6500	5.52	7.73	9.66	10.8	15.2	19.3	29.0	38.6
6600	5.59	7.82	9.78	10.9	15.4	19.6	29.3	39.1
6700	5.65	7.91	9.89	11.0	15.5	19.8	29.7	39.6
6800	5.72	8.00	10.0	11.1	15.7	20.0	30.0	40.0
6900	5.78	8.10	10.1	11.3	15.9	20.2	30.4	40.5
7000	5.85	8.19	10.2	11.4	16.1	20.5	30.7	40.9
7100	5.91	8.27	10.3	11.5	16.2	20.7	31.0	41.3
7200	5.96	8.35	10.4	11.6	16.4	20.9	31.3	41.7
7300	6.02	8.43	10.5	11.7	16.6	21.1	31.6	42.1
7400	6.07	8.51	10.6	11.8	16.7	21.3	31.9	42.5
7500	6.13	8.59	10.7	12.0	1°.9	21.5	32.2	42.9

BELT SPEED Ft./min.	1A	1B	1C	2A	2B	2C	3C	4C
7600	6.19	8.66	10.8	12.1	17.0	21.7	32.5	43.3
7700	6.24	8.74	10.9	12.2	17.2	21.9	32.8	43.7
7800	6.30	8.82	11.0	12.3	17.3	22.1	33.1	44.2
7900	6.35	8.90	11.1	12.4	17.5	22.3	33.4	44.5
8000	6.41	8.98	11.2	12.5	17.6	22.5	33.7	44.9
8100	6.46	9.04	11.3	12.6	17.8	22.6	33.9	45.2
8200	6.50	9.11	11.4	12.7	17.9	22.8	34.2	45.5
8300	6.55	9.17	11.5	12.8	18.0	22.9	94.4	45.9
8400	6.59	9.24	11.6	12.9	18.1	23.1	34.6	46.2
8500	6.64	9.30	11.6	13.0	18.3	23.3	34.9	46.5
8600	6.69	9.36	11.7	13.0	18.4	23.4	35.1	46.8
8700	6.73	9.43	11.8	13.1	18.5	23.6	35.4	47.1
8800	6.78	9.49	11.9	13.2	18.7	23.7	35.6	47.5
8900	6.82	9.56	12.0	13.3	18.8	23.9	35.8	47.8
9000	6.87	9.62	12.0	13.4	18.9	24.1	36.1	48.1
9100	6.90	9.67	12.1	13.5	19.0	24.2	36.3	48.3
9200	6.94	9.71	12.2	13.5	19.1	24.3	36.4	48.6
9300	6.97	9.76	12.2	13.6	19.2	24.4	36.6	48.8
9400	7.01	9.81	12.3	13.7	19.3	24.5	36.8	49.1
9500	7.04	9.86	12.3	13.7	19.4	24.6	37.0	49.3
9600	7.07	9.90	12.4	13.8	19.5	24.8	37.1	49.5
9700	7.11	9.95	12.4	13.9	19.6	24.9	37.3	49.8
9800	7.14	10.0	12.5	13.9	19.6	25.0	37.5	50.0
9900	7.18	10.0	12.6	14.0	19.7	25.1	37.7	50.2
10000	7.21	10.1	12.6	14.1	19.8	25.2	37.9	50.5

Northeastern PIMA Holds Annual Confab

The finest of New England's fall weather prevailed as members and industrial affiliates of the Northeastern Division, Paper Industry Management Ass'n. convened at the Poland Spring House, Maine, for their thirty-ninth annual meeting.

The first day of the three-day affair, September 17-19, was concerned with a general meeting and technical sessions on wires and felts. The remaining two days were devoted to having a most enjoyable time, which is the way it was. Cares and worries were left behind at the mill as the superintendents and their wives engaged in golf, cribbage tournaments, softball, picnics, trap shooting, dancing, Sloppy-Joe parties and several other diversions.

Elections

Officers for the 1959-60 year were elected during the general meeting. They are: chairman, Charles M. Durkee of Great Northern Paper Co., Millinocket, Me.; first vice chairman, Thomas J. Stiles of Brown Co., Berlin, N. H.; second vice chairman, Eli B. Denton of Keyes Fibre Co., Waterville, Me.; third vice chairman, Hugh H. Morton of S. D. Warren Co., Cumberland Mills, Me. All of these men served as the Division's 1958-1959 officers, each moving up one link in the chain for the coming year. The exception is Mr. Morton who was newly-elected to the staff this year. Re-elected for the twenty-second consecutive year as secretary-treasurer was Mrs. Marian L. Stewart of Lincoln, N. H. Incoming industrial affiliates representative was announced as being W. Eastburn, of Olin-Mathieson Chemical Corp.

L. Ward

The retiring chairman is J. Campbell Nivison of Scott Paper Co., H. & W. Div., Waterville, Me.

The recipent of the annual Fred C. Boyce award for scholastic achievement is Richard R. Perrault, a senior student enrolled in the chemical engineering department's pulp and paper technology course at the University of Maine. Professor C. M. Howell introduced Mr. Perrault, and chairman Nivison presented the $200 check.

One of the reasons behind PIMA's recent name change from the former American Pulp & Paper Mill Superintendents Assn. was to enable them to enlarge upon the category of management people who would be eligible for membership in PIMA. A brief report was presented on how PIMA is trending towards this objective by carefully compiling lists of potential members gleaned from trade journals and many other sources.

Technical Panel

Four papers, two concerned with felt problems and two dwelling on fourdrinier wire life and corrosion were presented at the Friday morning session.

Putting A Number on Felt Hairs— A felt is worn out, as it was explained, when there is a noticeable upturn in the number of felt hairs present on the sheet. The problem was to effectively estimate this number. Lowell Ward, research engineer with Huyck Felt Co., described how a slotted, two foot wide, hard-rubber scraper, attached to an ordinary household vacuum cleaner picked the hairs from the sheet and collected them in a fine-mesh wire cup. The scraper unit is held against the travelling web, at a spot just prior to the calender stack. Mr. Ward was assisted by Warren C. Nagler, Huyck Felt sales engineer.

NE-PIMA's 1959-60 slate of officers are (l-r): C. Durkee, chm.; T. Stiles, 1st vice-chm.; J. Nivison, retiring chm.; E. Denton, 2nd vice-chm.; M. Stewart, sec. treas.; H. Morton, 3rd vice-chm.; and W. Stroud, Huyck Felt Co., outgoing industrial affiliates representative.

Richard R. Perrault, senior at the University of Maine, receives the Fred C. Boyce award from officiating chairman J. Nivison. Professor C. M. Howell (l) introduced Mr. Perrault. Eyeing the award is Bemis P. Wood, 3rd vice chairman of national PIMA and chairman of Conn. Valley Division.

A. G. Hose

E. C. Reed

D. Stutz

Wire Corrosion—A. G. Hose, manager of technical service, and H. Quinn, technical service, Lindsay Wire Weaving Co., listed the principal causes of wire corrosion as including temperature rise, chemical contact, anodic reaction, and stress. They noted particularly that a doubling in temperature of the white water solution could quadruple the corrosion; however, counteracting forces retarded greatly this corrosive effect in practice. Mentioned as defenses against corrosion were nickel coatings, organic coating of the shoot wires, cathoding, and inhibitors.

Felt Washing for Improved Felt Performance—E. C. Reed, vice president of manufacturing, Albany Felt Co., paralleled his remarks on the various systems for washing felts with notes on the role of the mill superintendent to the felt service engineer. In discussions with the superintendent, the engineer has to get precise information on size, loading, finish requirements, drainage, treatment, etc., etc., so he can carefully analyze them before he makes his recommendations. L. H. Brown, service engineer, Albany Felt Co. assisted Mr. Reed.

Wire Life Problems—"Hanging," said D. Stutz, assistant works manager, Appleton Wire Works, Inc. accelerates mechanical wear and shortens life of the wire. Hanging can complicate wire guiding, and intensify ridging and grooving, and seam marking. The largest cause of this trouble is too high a vacuum in the suction boxes. The solution is to generally employ more boxes and less vacuum, if possible, or more wire shake. More frequent dressing of box covers should possibly be employed. Filler abrasion was also noted as an occasional cause of hanging.

PJT NEW LITERATURE

Adjust-O-Feeder
Model 1107

Contains a photograph of this plunger-type, small capacity proportioning pump, engineering and dimensional data, description of the pump features and a list of the boiler water treatment chemicals handled. Bulletin 1107-.20-1. B-I-F Industries, Inc., 345 Harris Ave., Providence, R. I.

A-C Fork Lift
Trucks

Illustrations, including cutaways, help describe the engineering, construction and operating features of the FT Series fork lift trucks. Booklet BU-451A. Allis-Chalmers Mfg. Co., Engine-Material Handling Div., Milwaukee, Wis.

High Pressure Boiler
Water Gauge

Gives details of operation, construction and ratings of Refragage, which uses light refraction to give black and white readings of liquid levels. Data Unit 356. Jerguson Gage & Valve Co., 80 Adams St., Burlington, Mass.

Pneumatic Tire
Fork Truck

Includes drawings which indicate dimensions, turning radius and upright and upright heights. Tables give load capacities and stacking ability. This machine is a gas powered, pneumatic tire truck of 2000 lbs. capacity designed for handling and tiering over rough floors in congested areas. Brochure. Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.

Walworth Iron
Valves

Lists service ratings, sizes and dimensions, and material specifications for all of these iron body gate valves that have application in nearly every industry. Circular. Walworth Co., 750 Third Ave., New York 17, N. Y.

Wall Type Basis
Weight Scales

Outlines the uses and features of this scale and describes in detail the exclusive multi-range instrument dial. Bulletin 321-BW. Thwing-Albert Instrument Co., Penn St. & Pulaski Ave., Philadelphia 44, Pa.

America on
Paper

Highlights the importance to our civilization of paper, which quietly plays its significant role in the world. Booklet. Wausau Paper Mills Co., Brokaw, Wis.

Electric-Powered
Mobile Crane

Presents a picture of each mobile crane model plus engineering drawings showing detailed specifications, turning radius, etc. Other pertinent design and operating data is also included. 6p Folder. Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, Ohio.

Mount Hope
Rolls

Tells how a prominent paper mill cut production costs despite rising wages and increasing cost of materials by use of these rolls. Bulletin. Mount Hope Machinery Co., 15 Fifth St., Taunton, Mass.

U. S. Testing Materials
Evaluation Facilities

Describes their extensive facilities and services for analysis, development, research, and inspection of materials and products. Bulletin 5902. U. S. Testing Co., 1415 Park Ave., Hoboken, N. J.

Developments in Heating and Drying Subject of One Day Symposium

Suppliers present six papers in a program sponsored by the American Gas Assn. for the members of the Ohio Section of TAPPI.

Ernest F. Barker,
Special Correspondent,
Paper Trade Journal

The American Gas Ass'n. and the Ohio Section of TAPPI sponsored an all-day symposium on heating and drying in the paper industry in mid-September at the Manchester Hotel in Middletown, Ohio. Attendance was well in excess of 200 papermakers who came to hear six papers devoted to heating and drying.

Virgil E. Perry, of Harding-Jones Paper Co., Excello, chairman of the Ohio Section of TAPPI, opened the seminar with greetings on behalf of the Ohio Section. E. V. K. Schutt of Central Hudson Gas & Electric Corp., Newburgh, N. Y., was chairman of the morning session. C. S. Sweitzer, Gardner Board and Carton Co., Middletown, Ohio, presided over the afternoon session.

Drying of Paper

Roy Whitney, dean of the Institute of Paper Chemistry, presented the after dinner address with a paper entitled "The Drying of Paper." Here are highlights from Dr. Whitney's address.

Drying is one of the neglected operations of the pulp and paper industry. In spite of its significance in papermaking, we know very little about it from a quantitative standpoint. Drying as a production limitation.

About 50 million tons of pulp, paper and board are dried annually in the U. S. This is equivalent to 100 million tons of water evaporated, or a steam cost of about $300 to $400 million per year. At $6 to $8 per ton of paper, this still represents only a few per cent of the total cost of paper, and perhaps explains in part relative lack of interest in drying.

Dr. Whitney made the following points: Drying is essentially an example of simultaneous heat and mass transfer. The problem in drying is basically a lack of understanding of the mechanisms of these operations. For example: Does water move within the sheet, and if so how? How does vapor move? Where does vaporization occur? How is heat transferred? What are the major resistances to these operations?

He discussed air drying and delved into the highly technical aspects of such factors as preheating, constant rate period (wet bulb temperature), critical moisture content, etc. He said that there is a period when temperature decreases and rate of vaporization drops, either because the surface is no longer saturated or the zone of vaporization moves into the sheet. The temperature rises as drying proceeds more and more slowly. During the initial nearly "constant rate" period, vaporization occurs at both sheet surfaces, with much more at the hot surface. The rate of water movement must be very nearly in the steady state, judging from moisture gradient curves. Following this period there is a rapid decrease in drying rate as the sheet dries out. The sharper temperature distribution is the result of the progresively increasing resistance to heat transfer, coupled with the requirements of the energy balance.

High Velocity Drying

M. H. Vander Velde of J. O. Ross Engineering Division of Midland-Ross Corp. presented various thoughts on "High Velocity Drying of Clay Coated Papers." He started with a brief review of drying in general: In drying, water in the web is changed to vapor and the vapor is then carried away, requiring the addition of heat to evaporate the water. Roughly, 1000 B.T.U.'s are required to evaporate one pound of water. Transferring heat from one media, air, to another media, the sheet, is representated by the formula: Heat = Coefficient × area × (T1-T2). In drying a paper web, T1 and T2 are air temperature and sheet temperature respectively. Drying rate is then expressed as:

$$\text{Drying rate} = \frac{\text{Coefficient} \times \text{area} \times (\text{Temp Air} - \text{Temp Web})}{1000}$$

Drying-air humidity has an effect on drying rate. It also affects web temperature. Therefore, the simplified formula should include the effect of moisture in the air supply. This formula gives a good guide to investigate the possibilities of increasing drying rates.

An important aspect in dryer design is to get the supply air into intimate contact with the web. The better the contact, the higher the coefficient of transfer. With poor contact, the web will be surrounded with stagnant moist air not far from sheet temperature, and heat transfer and drying rate will be low. High velocity at the web surface is created to get

the supply air in intimate contact with the web. The layer next to the sheet is scrubbed away as soon as it has given heat to the web, and replaced with high temperature dry air.

The air layer next to the sheet is removed by two means: (1) With lateral flow (flow parallel to the surface of the sheet) or (2) by impinging air at an angle to the sheet. It is found generally that impinging air against the sheet is more economical and that it lends itself to better physical dryer arrangement.

The lower the wet bulb temperature of the supply air, the cooler the sheet will remain. The temperature difference between a cool sheet and the hot air supply will be greater and the drying more rapid.

The following factors increase drying rate: (1) Increase air supply temperature. (2) Decrease moisture content of the supply air. (3) Arrange for intimate contact between the sheet and supply air.

The practical way of attaining temperatures much above 320° or 350° is to go to gas heat. With gas heat any desired temperature is readily available. Gas heaters are usually of the direct type where products of combustion enter into the circulating air stream. This is entirely satisfactory for normal clay casein coating. High temperatures can also be attained with electric heat; but cost considerations generally make this impractical. Oil-fired indirect air heaters have also been used but they are being replaced with gas as the latter become generally more available.

On dryers operating at around 300°F. it is often found that the air flow through the dryer caused by web movement gives sufficient exhaust without making other provisions for exhaust. Moisture in the air supply is actually in the form of superheated steam, and since steam has about double the specific heat of air, a given weight of steam circulated can carry more heat than air.

The third item affecting drying rate is contact effectiveness of the supply air wih the web. This is an extremely important factor; without intimate contact of the supply air with the surface of the web, the other important factor—temperature difference—is poorly utilized. The generally most effective means of getting good scrubbing action is to impinge the air against the sheet. Jets of air spaced along the web pierce the stagnant layer of air and water vapor.

When we get away from the consideration of drying, as only the removal of water, and change it into the practical requirement of producing a satisfactorily coated sheet, a whole new field of requirements presents itself. Among these are: (1) Adhesion of the coating to the sheet (Pick Test). (2) finish (a) pinholes, (b) cracks—crazing, (c) smoothness. (3) ink receptivity. (4) brightness (discoloration). (5) curl. (6) flexibility of coating and sheet (bending quality).

Roy Whitney (left) dean of Institute of Paper Chemistry, and Virgil Perry, chairman of Ohio TAPPI.

These sheet characteristics are all affected by drying. For example, some special coatings are dried in the cycle which involves, first, cooling the sheet to set the coating, followed by relatively slow drying at medium temperatures with high humidities. Adhesion or satisfactory pick test requires that there be some penetration of the coating into the web and conversely, excessive penetration of the coating can be undesirable.

The drying rate affects the finish of the coating and this is most noticeable on relatively heavy coats, where it is necessary to dry without creating blisters which develop into pinholes or cracks. Heavy coatings are also more susceptible to distortion if the coating viscosity is low. A high-solids viscous coating has less water to evaporate and it is generally able to withstand a rapid rate of drying better than a low-solids coating. A combination of high-solids and light-coat weight permits very rapid drying with a compact dryer.

In nozzle design in a high velocity system, the velocity at the web surface is of prime importance. This is a function of effective slot diameter and the distance from the sheet. Practical clearance considerations require a reasonable distance between the nozzle and the web, but still too close for access. This makes it necessary to have provision for retracting the dryer for threading or cleaning. The path of return air must also be considered in design. If return air flow must pass to edges of sheet to the recirculation chamber, the transverse air flow tends to dry the edges more than the center. Recirculation without transverse flow is therefore desirable and it is important on wide sheets.

A very early type of dryer is the festoon type with steam coils mounted below the loops or with an air system directing air into the loops. The festoon dryer is still used in some modern mills for certain types of clay coating. A later development is the straight pass dryer. It does an excellent job on low solids coatings. A modification of a straight pass dryer with the return pass held against the conveyor with air pressure is for heavy coating—10 lb./1000 sq. ft. This is an example of relatively slow drying, necessitated by characteristics of the coating. Impetus to the design of shorter dryers came with intercalender on-the-machine coating. Space was limited and dryers took the shape of towers.

A two-zone dryer with a moderate drying rate section followed by a high capacity section, gives reasonable compactness with flexibility. When coatings are applied in the machine dryer section very little space can be allotted to the air dryer. Coat weight and type of coating lend themselves to an all high velocity dryer.

Supplemental Drying

G. R. Van Kampen, Process Heating Co., spoke on "Supplemental Drying Through Radiant Heating." Radiant burners are drying units in

Morning session speakers, left to right: O. M. Olsen, vice president, Sellers Engineering Co., E.V.K. Schutt, industrial representative, Central Hudson Gas & Electric Corp., and G. R. Van Kampen, sales manager, Process Heating Co.

which gas is burned on or through ceramic, heating the ceramic surface to a temperature at which a substantial amount of heat is emitted by radiation. Typical temperatures range from 1500°F. to 2500°F., depending on the type of burner and the capacity at which it is operated. Color may vary from a dull red to a bright white. It is a recognized fact that use of hot ceramics accelerates combustion, making more complete and more rapid burning of the fuel mixture possible. The result is a concentrated and relatively economical source of radiant heat.

There have been so many spectacular claims regarding "infra-red" or radiant heat that prospective users are at times confused. However, it does offer unequaled advantages for many drying processes: (1) the rapid transfer of a large amount of heat in limited space; (2) direct heat without flame impingement; (3) freedom from physical contact between heat source and material being dried; (4) penetration of surface film of air; (5) delivery of heat with no disturbing air velocity.

The following are a few considerations and precautionary points in the use of radiant burners.

1. Burners should not be located directly under metal rolls or shafts which would accumulate heat. Possibility of heat reaching bearings must be considered. This can often be taken care of by shielding.

2. Burners should not be installed near wooden beams or roofs which would be dried and might eventually ignite.

3. On paper machines where rope carriers are used, it is desirable to shield the rope in burner areas, or to moisten the rope by spraying.

4. With open installations there should be adequate exhaust for the burner area. This is important to prevent heat backing into the room to the discomfort of operators, and to carry off the additional moisture removed from the paper.

5. Controls and safeguards should be planned to meet the specific requirements of each job and in accordance with the requirements of underwriters.

6. It is general practice to monitor burners with flame-rod type combustion safeguards which permit opening of main gas valves only after ignition has been established. These will turn burners off if normal combustion is interrupted and will eliminate the possibility of accumulating unburned gas.

7. Photo-electric or mechanical paper-break switches may be used to turn burners off if the sheet breaks. Centrifugal switches interlocked with the controls prevent burner operation unless machine is running at a predetermined speed. Additional controls can regulate burner capacity for a slow speed operation.

8. When burners are enclosed the installation becomes an oven job, requiring customary oven controls, including a purging cycle, positive exhaust with air flow switch, high limit switch and automatic temperature control.

One of the most frequent uses for radiant burners is at the wet end of a paper machine, if dryer felts are not used and when there is no felt between the last, the press and the first dryer. This usually involves board, roofing felt, or some of the heavy absorbent papers. Burners may be applied above and below the sheet between the press and dryers or near the lower portions of the first dryers. At the wet end of the machine the moisture content is normally high and evaporation will maintain safe sheet temperatures, as previously mentioned. Each burner can add drying capacity approximately equal to that of a 42″ diameter dryer at 50 lb. pressure.

Pulp drying was also mentioned in this discussion: On a tonnage basis, pulp represents a substantial portion of the drying in the paper industry. Little has been done with radiant burners in pulp drying. There are two serious drawbacks — dryer felts are commonly used and it is difficult to find a location where pulp can be exposed to direct radiation from the burners. In addition, and of importance, the pulp is usually in the form of a thick sheet. The evaporative cooling which is a protection in the case of thinner material is a disadvantage. The r a d i a n t heat reaches the surface and to a very slight depth, resulting in surface drying without appreciably heating the interior of the pulp sheet. Where pulp is handled in a thin sheet, the same excellent results can be obtained as with light board, roofing felt, etc., assuming that it is possible to expose the sheet to the burners. Brightness is not a problem if burners are properly spaced. The evaporation maintains safe temperatures.

It is recognized that increasing the temperature of water in a sheet increases the effectiveness of a press, and every pound of water removed mechanically reduces the amount to be evaporated at the dryers. This has led to various means of raising sheet temperature at the press, one of which is the use of radiant burners. To deliver adequate heat, it is desirable to apply burners to both sides of the sheet. This necessitates elevating the sheet to provide space for burners on the under side. It is also necessary to keep burners well away from press rolls because of the high ambient temperature. Most installations of this type have been kept more or less secret, but experience indicates that increasing sheet temperature up to approximately 130°F. results in a substantial increase in the amount of water removed at the press. Some users of radiant burners for hot press are

enthusiastic and feel that profitable increases in tonnage are obtained. Consideration of the heat used indicates that just about the same results per unit of heat are obtained as with radiant burners installed just ahead of, around, or under the first dryers.

Radiant burners can usually be installed at a far lower cost than other equipment of comparable capacity. Radiant burners installed at the wet end of a paper machine often increase drying capacity by 10 to 15 per cent, or more. Additional space is not required and boiler load is not increased. Both are important. Providing room for additional dryers can be costly — sometimes necessitating building changes. Where steam capacity is limited, it is an expensive matter to provide additional steam. Cost of fuel to operate burners at a specific capacity can be readily determined. The gas is metered and rates are established for a given volume of gas having a specified B.t.u. content. In estimating fuel costs per ton of paper dried, it is well to allow 3000—3500 B.t.u. per pound of water evaporated.

Ink and Adhesive Drying

Carl P. Mann, drying division, Selas Corp. of America, presented a paper: "Direct Gas Drying of Inks and Adhesives." Following are highlights.

Direct gas drying employs very high thermal heads, and the necessarily high temperatures required for these heads are obtained either by direct contact with the gas flame or by converting the heat of the gas flame to radiant heat and applying this radiant heat to the work, or a combination of both. There are a number of different types of burners which are used for direct flame contact with the work in process, depending on the operation to be performed and the character of the work piece. For low intensity applications where small turndown ratio is required, the ordinary drilled pipe ribbon burner may be used. Where high intensity is required for high speed production, or the control covers a considerable range, requiring a large turndown ratio, the design of the ribbon burner becomes more elaborate and refined.

One of the great advantages of the radiant burner is its ability to transfer heat to the traveling web without interference from the cold air stratus because air is transparent to radiant heat rays. The heat of a gas flame is converted to radiant heat by causing the flame to burn along the surface of insulating refractory material. For applying radiant burners to webs of paper or meal, a multiplicity of such burner units are mounted in rows to cover the full web width.

In the metal industries, the use of very high thermal heads has been long accepted practice, and in recent years great improvements have been made in the techniques of applying higher and higher thermal heads. In the heat processing of combustible materials, however, the application of higher thermal heads has been a relatively recent development.

Drying ink on paper is a much more sensitive process than drying ink on metal and requires an extremely precise balance between the temperature applied and the time of exposure to the heat. In direct gas drying, this time is a matter of fractions of a second. Paper is scorched at a temperature in the 300°F. range, depending on the period of time it remains at that temperature, and some of the desirable characteristics of paper are lost at temperatures only slightly below the scorching point. In order that a successful ink drying process be attained, it is necessary that the ink dry rapidly at a temperature below that which will adversely affect the paper, and yet remain stable indefinitely at ordinary room temperatures. In the printing industry, ink manufacturers have solved this problem most satisfactorily so that today web speeds have reached over 1500 f.p.m., and this speed limitation is imposed by printing mechanisms rather than by ink formulations.

On printing presses, direct gas drying is effected by either radiant heat or by direct flame contact, and the choice of which to use is largely a question of details of controls, press design and economics.

Where flame contact ribbon burners are used for ink drying on paper, the rows of burners are placed across the web so that the stiff flame of the burner contacts the paper. When the web is stopped, the flame is turned completely off and cold air is blown against the web between the burners to keep the paper cool.

Radiant heat has been applied in numerous instances for drying the adhesive applied to paper. In the book binding industry, one operation requires that glue be applied to the backs of books after they have been sewed and before the crash reinforcement has been applied. The glue used in this operation requires from four to eight hours to air-dry, depending on the atmospheric humidity. Because of this, large floor space is required to store the books while drying, and there is much manual rehandling of the books. By a properly designed system, the glued backs of these books may be exposed to radiant heat while on a conveyor, and the heat will dry the glue in four minutes. This heat application makes this operation independent of weather conditions, saves great floor area and expensive unnecessary rehandling.

In the manufacture of gummed paper, the direct application of radiant heat is being used to accelerate the drying of the adhesive. This is accomplished by passing the gummed side of the paper under radiant heat immediately after the gumming operation, thereby adding the sensible and latent heat to the adhesive to bring the moisture in the glue to the evaporating point, and then finish the drying in a convection drying operation.

Afternoon session speakers, left to right: Carl P. Mann, manager, drying division, Selas Corp. of America; M. H. Vander Velde, sales engineer, J. O. Ross Engineering Division of Midland-Ross Corp.; G. Owen Kuhen, sales manager, Carrier Corp.; and C. S. Sweitzer, Gardner Board and Carton Co.

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In the manufacture of one design of paper milk bottles, radiant heat is used to heat seal the final seam of the bottle. One interesting aspect of this operation is that in this instance, the heat is applied to the side of the paper opposite to the adhesive so that the radiant heat must penetrate through the thickness of the paper to dry the adhesive.

In the manufacture of aluminum foil, the adhesive used to laminate the paper to the aluminum web is dried by passing the laminated web under a ribbon burner, after which the web is rewound.

Package Boilers

O. M. Olsen, Sellers Engineering Co., presented a paper entitled: "Package Boilers in the Paper Process Industries."

The descriptive term, "package steam boiler" is commonly applied to complete, self-contained, factory assembled and tested units requiring only connection to service lines and the stack to be ready for operation. They are not portable in the sense that they are truck mounted for easy transport from place to place in a plant but the completeness and compactness of even the larger sizes makes relocation a relatively simple matter. Package boilers may be designed for gas or oil firing only or they may be equipped with combination burners which efficiently burn either fuel. The size range of package boilers is generally from fifteen to six hundred horse power—occasionally a seven hundred horse power size is included. Strictly speaking, gas-and-oil-designed steam boilers in this capacity range have for many years been in the classification of what we now call the "package boiler." However, it remained for the last World War to focus attention on the package nature of such boilers, to give the term wide acceptance, to extend the capacity range upward and to lead to still more compactness of assembly. In very recent years, there have been great improvements in safety and economy of operation.

Just as a generation or more ago small electric motors swept the line shaft out of the modern plant so today we find small package boilers located close to the point of steam use. We see large centrally located high pressure power boilers eliminated from plans for new construction. No longer is it necessary to operate heating boilers at a fraction of full capacity to supply process steam during the summer months. The method of plant heating can be determined without reference to process steam requirements—often with direct advantages when summer air conditioning is contemplated. Licensed engineers for boiler operation are often no longer required. Greater flexibility of operations and greater economy have resulted from the location at points of use of correctly sized package boilers which provide steam at the pressure most suitable for the particular operation. And gone are long steam supply lines and condensate return lines—costly to install and insulate, costly to maintain and wasteful of the fuel required to compensate for excessive line losses.

The first consideration in the selection of a package boiler is the determination of the fuel. If gas is available without interruption there is no second choice—the advantages of gas are too well known. If local regulations require standby fuel, the requirements can be met in several ways.

1. By the installation of a combination gas-oil boiler.

2. By the provision of propane as a standby fuel.

3. by the availability of steam from another source not affected by standby restrictions.

The generally accepted package boilers bracketing the size range specified—from fifteen to six hundred horse power—fall into one of the following classifications.

1. *The Scotch Marine Type:* This design incorporates a large firing tube,—commonly referred to as the Morrison tube—and a battery of return tubes through which the hot gases pass on their way to the flue at the front of the boiler.

2. *Multipass Fire Tube Boilers:* This type of boiler is the product of a number of well known manufacturers. It had its origin in the basic Scotch Marine design. In addition to the firing tube, the multipass boiler has one, two or three additional banks of tubes through which the hot gases are conducted. They are designated as two, three or four pass boilers. The number of tubes in the successive tube banks is reduced to compensate for the decreasing volume of the gases as they are cooled by transfer of heat to the boiler water.

3. *Immersion Fired Boilers:* The immersion-fired package boiler differs from other types of horizontal boilers in that instead of having a single firing tube, it has numerous widely dispersed firing tubes which constitute a series of individual combustion chambers. The tubes are totally submerged in the boiler water. Immersion-fired boilers are designed for gas firing only.

PJT NEWS OF CONVERTERS

Wyomissing P. P. Co. Completes Expansion

Wyomissing Paper Products Co. announces the completion of a new 150,000 sq. ft. plant in Muhlenberg Township, six miles north of Reading, Pa.

The new structure replaces its old multi-story building in West Reading, Pa., and consolidates its warehousing facilities. Modern design and the use of multi-height storage (stacking) enabled Wyomissing to increase its productive capacity while decreasing its total production area.

New H & D Regional Engineer

Appointment of Louis Dela Grange as regional engineer for the Hinde & Dauch Division of West Virginia Pulp and Paper Co. has been announced.

In his new position Mr. Grange will undertake engineering projects in regard to H&D equipment and buildings at the Cleveland, Detroit, Eaton, Ohio, and Sandusky plant locations. Hinde & Dauch, one of the nation's leading producers of corrugated boxes and interior packing materials, operates 15 plants throughout the East, South and Midwest.

Mr. Grange comes to Hinde & Dauch with nine years experience as a field engineer with West Virginia's central engineering department. He has a B.S. degree in mechanical engineering from Indiana Technical College and a B.S. degree in electrical engineering from Purdue University.

Mt. Joy Paper Box Buys Lititz Plant

The Mount Joy Paper Box Co. has purchased the Simplex Paper Box Corp., Lititz, Pa., and plans to move the Lititz box-making facilities to its home plant in Mount Joy.

The Downingtown Paper Co. was the former owner of Simplex.

St. Regis Plans for Chemical Packaging

St. Regis Paper Company announces that Chemical Packaging Corp., which it recently acquired through an exchange of stock, will be operated as a subsidiary specializing in the sale of multiwall bags and packaging equipment to the fertilizer industry east of the Mississippi River.

Richard Heard, president of Chemical Packaging, will continue in that capacity, which will assure continuity of operations while assisting in the smooth merger of the packaging group into St. Regis. In this regard, Mr. Heard will work directly with Bernard W. Recknagel, vice president and general manager of the St. Regis Flexible Packaging Products Sales Division.

Donald F. Stewart, vice president and treasurer of Chemical Packaging, will continue his present responsibilities, including financial and accounting affairs for the corporation.

The Savannah, Ga., and Louisville, Ky., plants of Chemical Packaging Corp. will become a part of the St. Regis eastern bag plant group. Sales of Chemical Packaging Corp. will be under the overall direction of Charles A. Woodcock, director of eastern operations, flexible packaging products sales division.

William S. Doolan, sales manager of Chemical Packaging Corp., will work directly with Mr. Woodcock to maintain the specialized attention given to fertilizer bag customers and coordinate with regional offices of the eastern area sales group of the flexible packaging products sales division.

Federal Paper Board Purchases Sweeney

Federal Paper Board Co., Inc., has purchased for cash the Sweeney Lithograph Co., Inc. of Belleville, New Jersey.

Terms of the transaction were not disclosed. Sweeney has annual sales of about $1½ million. William H. Glover, Jr., president of the lithograph company, will continue in charge of the Belleville operations, it was stated.

McNamara of Sealright Honored

R. Reid McNamara, president of Sealright Co., Inc., was honored for his 20 years of service at a recent

F. C. Ash, right, presents award to R. Reid McNamara

dinner during the company's annual regional sales managers' meeting here.

In making the award of his service pin and a morocco bound testimonial scroll, containing the signatures of the entire Sealright sales and service organizations, F. C. Ash, chairman of the board of the parent Sealright-Oswego Falls Corp., cited Mr. McNamara for leading the growth of Sealright sales to a projected $50,000,000 in 1959.

Also presented with service awards were J. O. Crenshaw, St. Louis regional sales manager, and C. E. Rondomanski, director of advertising and merchandising, both for 15 years of service.

SEVEN YEARS AGO

Bauer Centri-Cleaners introduced new ideas about making clean paper

Imitated in appearance but never equalled in efficiency and length of service—that's the story of Bauer Centri-Cleaners since their first installation in 1952.

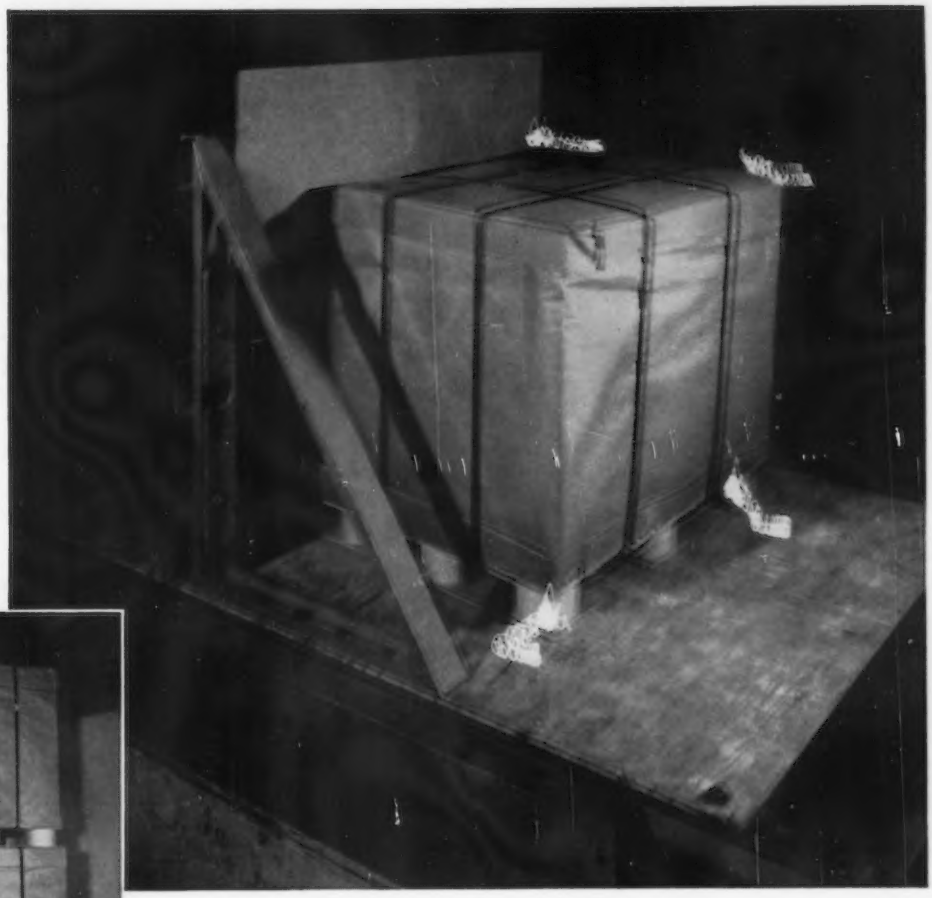
Cleanliness figures from hundreds of mills, plus results from tough, impartial tests on all kinds of pulp, prove their value in cleaning pulp and furnish to the highest degree possible.

The many original installations still in use attest to the durability and know-how built into every unit.

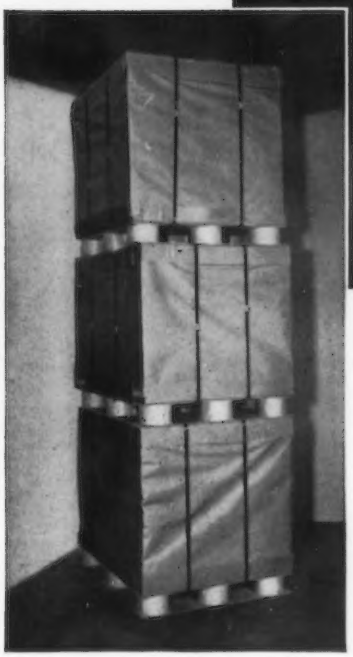
If cleaner paper or board is your aim, ask the Bauer man about the Centri-Cleaner best for your needs. For a quick glance at our complete line, ask for Bulletin P-4-D.

The Bauer Bros. Co., 1758 Sheridan Ave., Springfield, Ohio

This No. 600 Centri-Cleaner is from one of the original installations and still shows no sign of wear.



Vibration test of 3000 pound load of paper in Signode Packaging Laboratory. Vibrator handles up to 3 tons at accelerations over one G.



Solid, strong packs readily stack three high without loosening straps on bottom pack.

Shake well before shipping!

Signode is working with several leading paper companies to find ways to reduce damage and lower the cost of shipping skids of paper. We are evaluating the packaging of paper under compression, various ways of reducing the cost of skid tops and of skid platforms, and various strapping patterns. The low cost experimental load shown in the photograph is being tested under heavy vibration in Signode's research laboratory. After completion of laboratory tests, Signode sends engineers to check on the arrival condition of test shipments.

If you ship paper, let Signode help you with methods that eliminate damage and reduce costs... with testing facilities that prove performance in advance... with new types of strapping equipment developed to meet your needs. Find out what these services can mean to you. There's no cost or obligation. Just write:

SIGNODE

First in steel strapping

SIGNODE STEEL STRAPPING CO.

2677 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

You'll Get Longer Life, Better Performance With

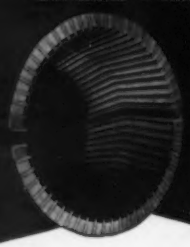
BLACK-CLAWSON X-66 JORDAN PLUGS

High strength, BlaCaloy (ductile iron) castings—precision machined. Special Mox 4 bands hold bars firmly in slots—with a full 1 inch side metal support both sides of bars—full length. Rotation of plug can be reversed for maximum jordan efficiency.

Fillings available in all materials. Full length beads on each side of bars prevent spacers from rising.

Super-Rigid

BULLDOG SHELL FILLINGS



Write for Bulletin 22

The original pre-assembled filling—for all makes of jordans.

Assembled in special jigs for rigidity and perfect symmetry. Every bar and spacer keyed with heavy bands and reinforced for maximum strength.

Shipped to You in a Strong Fibre Container

Lighter, easier and safer to handle. Fillings stay clean and dry. Facilitates storage and inventory checks.

Available only from:

THE BLACK-CLAWSON COMPANY

SHARTLE DIVISION

MIDDLETOWN, OHIO

Prices of Fibers

MARKET WOOD PULP

THIRD QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

Delivered Basis

	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$ 82.50/ 90.00	$ 82.50/ 90.00	§$90.00/ —	§$80.00/ —	§$90.00/ —
Bleached Gw'd	$ 97.50/100.00	$ 97.50/100.00			
Kraft, Blchd.	157.00/ —	160.00/162.50	§157.00/162.50*		§157.50/ —
Kraft, Blchd. Hdwd.	152.00/ —		§137.00/ —		
Kraft, Semi-bleached.	140.00/ —	140.00/ —			
Kraft, Unbl.	117.50/125.00	125.00/130.00	†125.00/130.00	125.00/ —	
Sulphite, Blchd.	155.00/ —	155.00/ —	*155.00/ —	*155.00/ —	155.00/ —
Sulphite, Bl. Hdwd.	150.00/ —				
Sulphite, Unblchd	135.00/ —	135.00/ —	†135.00/ —	*135.00/ —	
Sulphite, Unb'l, Gl'sn		140.00/ —	†134.00/ —		
Soda, Blchd.	147.00/150.00	150.00/ —			

§ On Dock Atlantic Ports. * Freight allowed. † Varying Freight Allowances

COTTON LINTERS

F.O.B. OIL MILLS
WEEK ENDED SEPTEMBER 15

	Atlanta	Memphis	Dallas	Los Angeles
Grade 1	$8.75/8.50	n.a.	n.a.	n.a.
2	8.50/7.50	n.a.	n.a.	7.50
3	7.50/6.00	$7.50/7.00	6.75/6.50	7.00
4	6.00/5.25	6.25/5.75	6.25/5.25	6.50
5	5.25/4.75	5.25/4.75	4.75/4.50	5.75
6	4.75/3.50	4.50/4.25	4.00/3.25	3.50
7	3.50/2.50	4.00/3.00	3.00/2.75	3.00

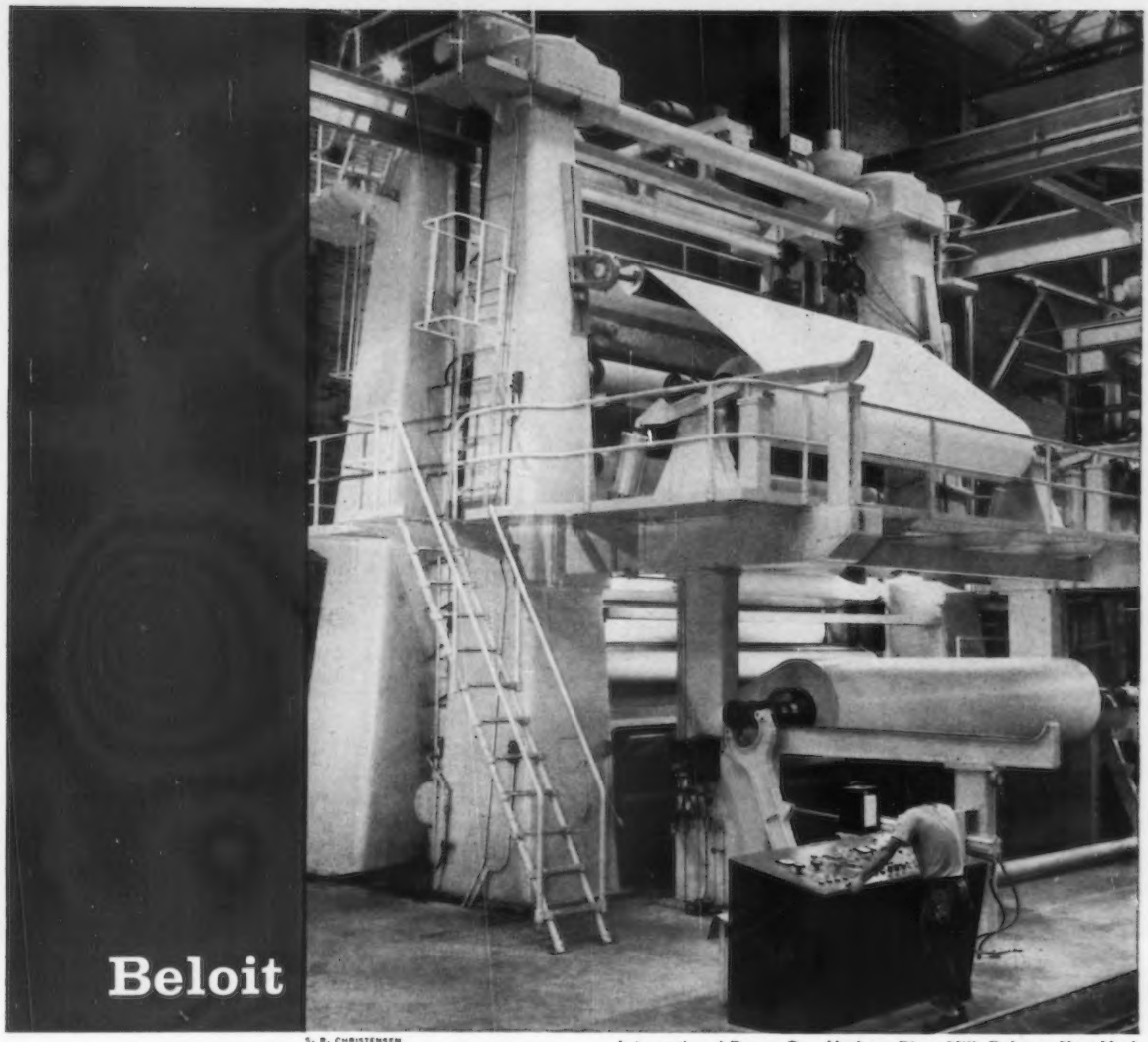
WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers and brokers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	Sept. 21	Sept. 21	Sept.	Sept.
No. 1 Mixed Paper	$ 10.00/ 12.00	12.00/ 14.00	9.00/ —	15.00/ —
No. 1 News	17.00/ 18.00	17.00/ 18.00	16.00/ —	17.00/ —
Overissue News (Lg. size)	16.00/ 18.00	15.00/ 17.00	21.00/ —	20.00/ —
Mill Wrappers	19.00/ 22.00	13.00/ 15.00	14.00/ —	15.00/ —
Old Corrugated Containers	24.00/ 25.00	23.50/ 24.00	23.00/ —	23.00/ —
Super Resorted Kraft Paper	35.00/ 40.00	— / —	35.00/ —	55.00/ —
New Double Kr. Ld. Corr. Cuts	35.00/ 37.50	37.50/ —	37.50/ —	35.00/ —
(Semi-chem. medium)	47.50/ —	47.50/ —	45.00/ —	36.00/ —
New 100% Kraft Corr. Cuts	40.00/ 42.50	— / —	57.50/ —	— / —
New Br. Kraft, Env. Cuts	70.00/ 75.00	70.00/ 75.00	52.50/ —	55.00/ —
New Br. Kr. Bag Waste Prntd.	55.00/ 60.00	55.00/ 60.00	52.50/ —	55.00/ —
New Br. Kr. Bag Waste Unprintd	60.00/ 65.00	65.00/ 75.00	60.00/ —	60.00/ —
No. 1 Groundwood Shvs.	25.00/ 30.00	25.00/ 30.00	24.00/ —	35.00/ —
White Newsblanks	65.00/ 70.00	53.50/ 60.00	45.00/ —	60.00/ —
No. 1 Soft White Shvs.	60.00/ 65.00	60.00/ 65.00	60.00/ —	70.00/ —
Super Soft White Shvs.	65.00/ 75.00	75.00/ 85.00	70.00/ —	— / —
Hd. White Shvs.	85.00/ 90.00	90.00/100.00	85.00/ —	95.00/ —
Hd. White Env. Cuts	100.00/105.00	105.00/110.00	90.00/ —	113.00/ —
Col. Tab. Cards	55.00/ 57.50	55.00/ 57.50	52.50/ —	45.00/ —
Manila Tab. Cards	77.50/ 80.00	77.50/ 80.00	75.00/ —	80.00/ —
No. 1 Col. Ledger	40.00/ 45.00	37.50/ 42.50	47.50/ —	35.00/ —
White Ledger	60.00/ 62.50	60.00/ 65.00	57.50/ —	55.00/ —
Mixed Book & Mag.†	25.00/ 28.00	— / —	17.00/ —	— / —
No. 1 Books‡	27.50/ 30.00	21.50/ 23.50	35.00/ —	17.50/ 19.50

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% of groundwood.



S. R. CHRISTENSEN

International Paper Co., Hudson River Mill, Palmer, New York

high-speed supercalenders

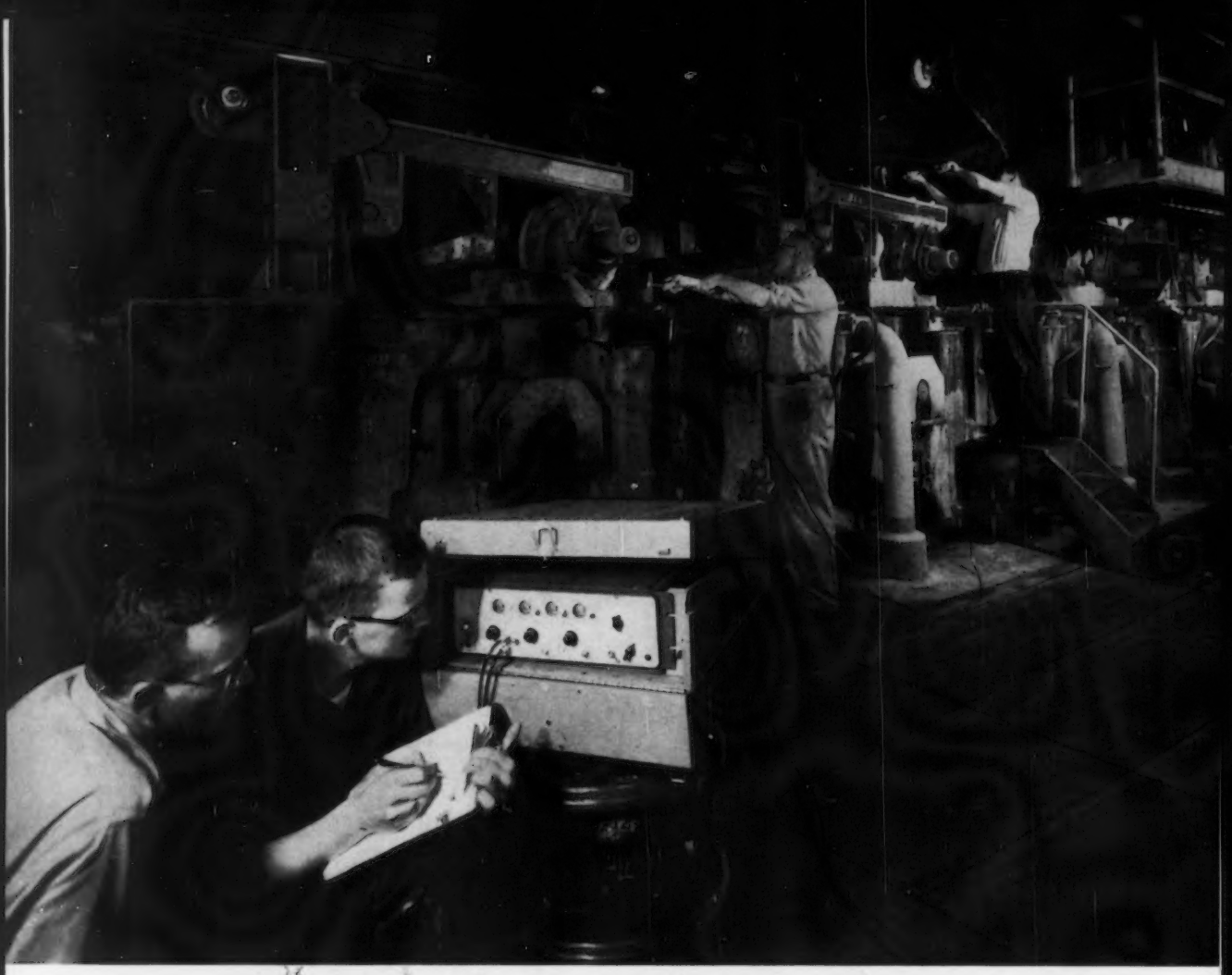
Rugged, dependable, compact . . . Beloit supercalenders are outstanding performers in the calendering of all grades of paper. Their practical design meets the most exacting demands for supercalendering in all widths and at speeds up to 2500 fpm. Features that contribute to Beloit performance are: resilient air-cushioned loading, quick roll change, renewable ways, fully adjustable gibs, complete unwind and rewind tension control, center or surface wind, special sheet threading arrangements, and positive high-speed lifts.

Why not discuss your supercalendering with a Beloit Sales Engineer? You will find his suggestions helpful. Beloit Iron Works, Beloit, Wisconsin.

your partner in papermaking

BELOIT IRON WORKS · PAPER MACHINERY · BELOIT WIS., U.S.A.

BELOIT
PAPER MACHINERY



Huyck Field Service Engineers, teamed with Papermakers, using Electronic Draw Speed Indicator to measure speeds of two draws simultaneously.

TYPICAL MACHINE PROBLEMS SOLVED BY NEW ELECTRONIC DRAW SPEED INDICATOR

MILL NO. 1.

PROBLEM: A cylinder machine running white patent coated board caused scuff marks to appear on top side of sheet.

SOLUTION: The Electronic Draw Speed Indicator detected slippage between top and bottom felts. Result: the mill superintendent was authorized to install helper drives on top press rolls.

MILL NO. 2.

PROBLEM: A high-speed yankee machine running wet crepe caused pick-up felts to stretch and wear out prematurely.

SOLUTION: The Electronic Draw Speed Indicator showed a slippage of 40 f.p.m. between the wire and pick-up felt. The answer: a helper drive was installed to redistribute the load.

MILL NO. 3.

PROBLEM: A cylinder machine running white patent coated board caused bottom felts to tear.

SOLUTION: The Electronic Draw Speed Indicator showed that drives were fluctuating to change draw speeds as much as 0.6% causing impact loads on the bottom felt. The approach: a thorough investigation is being made of the drive.

HUYCK FELTS

Huyck Felt Co.,
Rensselaer, N. Y.;
Aliceville, Ala.;
Division of F. C. Huyck & Sons.
In Canada: Kenwood Mills Ltd.,
Arnprior, Ontario.

ANOTHER HUYCK EXCLUSIVE...

A New Electronic Tool

that provides a quick...accurate analysis of machine problems

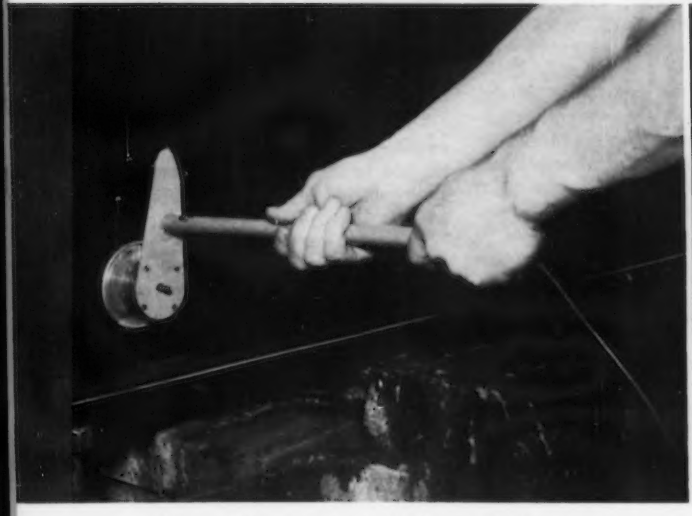
Latest of the new-day ideas introduced by Huyck for the betterment of papermaking is the revolutionary Electronic Draw Speed Indicator that provides quick...accurate answers to hard-to-solve machine problems.

The Electronic Draw Speed Indicator enables Huyck Field Service Engineers to measure *precisely and simultaneously* the speeds of various machine components. Felt and paper draw speeds are checked with utmost precision. Machine drives are more closely adjusted to avoid surging or discontinuous loads. Slippage is quickly pinpointed whether it occurs between two felts, felt and wire, or felts and rolls.

Most important of all the benefits arising from this newest of Huyck's *plus* services to papermakers is that coupled with new Huyck felts it paves the way to more efficient machine operation. The result: better production of better paper at lower felt cost per ton. Your Huyck Sales and Field Service Engineers will be glad to tell you more about it.

NEW HUYCK FELTS ☆ INDUSTRIAL FABRICS

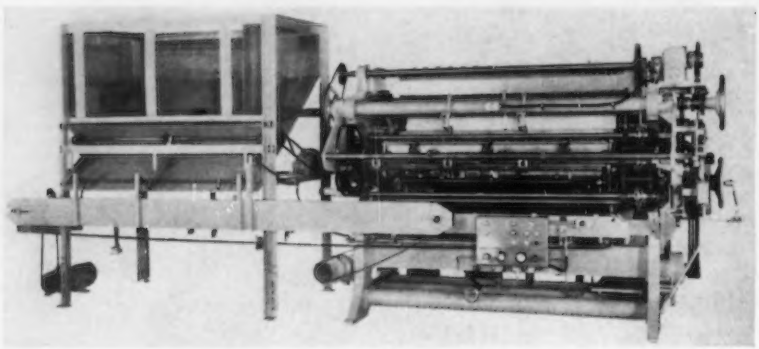
FIRST IN QUALITY • FIRST IN SERVICE SINCE 1870



Close-up of transducer and wheel measuring draw speed.

Huyck Field Service Engineer recording draw speed readings.

PJT NEW EQUIPMENT & SUPPLIES



Core Loader Automatic, High-Speed

As announced by Paper Converting Machine Co., Green Bay, Wis., the automatic Core Loader, Model 2765, gets higher speeds up to 15 long cores per minute, from its system for feeding and positioning cores, using a simple conveyor and pushing action with no reciprocating mass. It is designed to coordinate simply with an automatic rewinder in a production layout.

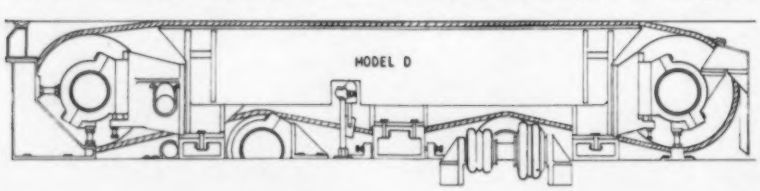
Positive feed and positioning of cores is assured and the machine has, according to the manufacturer, an exclusive roller system to guide the mandrel into the incoming core. Cull discharge and storage has been incorporated in the new core loader; as have log storage facilities or slit roll discharge.

The core loader may be used for almost any material that might be run through an automatic winder. This would include toilet paper, towels, wax paper rolls, and even in some cases aluminum foil.

Units Increase Fourdrinier Drainage

Beloit's Flo-Vac suction unit is designed to increase the productive capacity of fourdrinier machines. Basically, the unit consists of a rubber belt mounted on two revolving rolls, and passing over a compartmented suction box. Company spokesmen report these features: deflection held to a minimum; floating belt principle improves wire life; water-sealed antifriction bearings minimize drag; maximum open area; adjustable end deckles; divided stainless steel suction box permits precise control of drainage through graduated vacuums; and belt cleaning showers. In addition, reduced fourdrinier power requirements and greater drainage of secondary stock (on board machines) can be expected with the installation of a Flo-Vac unit.

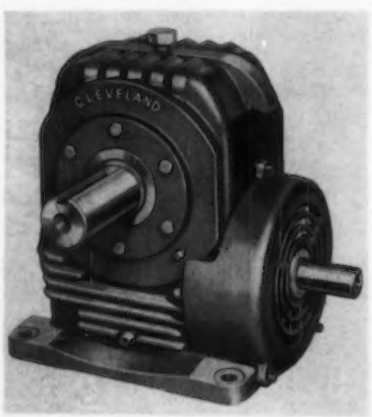
Four models are available. Model A is recommended for machines operating in the lower speed ranges as well as for higher speed machines running lighter grades up to trim widths of 150 inches. Model B is designed for trim widths from 100 to 250 inches on kraft grades, corrugating medium, publication grades, and newsprint. Beloit recommends Model C for heavy weight krafts and similar grades of all trim widths. In this model, a roll in the return belt run serves to hold constant belt tension. Model D can be adapted to production of linerboard, food board, extraheavy heavy weight kraft, pulp sheets, etc. Two return rolls are provided: one serves as an automatic guide, and the other acts as a belt tensioner.



The Flo-Vac unit can be mounted on any type of fourdrinier. It is necessary in all cases to mount a deflector following the unit. Saveall pans are also recommended in all cases. Optional features include: cantilever equipment for belt changes; remover rails for use with stationary fourdriniers; and remote vacuum control. Additional information, including recommendations as to which model best satisfies mill requirements, is available from Beloit Iron Works, Beloit, Wis.

High Hosepower Speed Reducers Fan-Cooled

The Cleveland Worm & Gear Co. announces a line of "high horsepower" sped reducers rated from 1 h.p. to 40 h.p. They are said to be



capable of transmitting as much as 80 per cent more horsepower above that carried by conventional worm gear units.

Housings are one-piece cast-iron ribbed for maximum strength and heat dissipation. Cooling fan is mounted on input end of worm shaft and is equally efficient in either direction of rotation. Only one gear shaft bearing plate is large enough to permit assembly of gear. The gear shaft extension side of the housing, the gear shaft bearing is mounted in the housing bore and backed up by

IDEAS

FROM THESE OUTSTANDING BOOKS WILL HELP YOU

MODERN PULP AND PAPER MAKING

Revised and enlarged 3rd Edition, edited by John B. Calkin, Consultant to the Pulp, Paper and Chemical Process Industries.
Completely describes and discusses all principles involved in modern pulp and paper making. 558 pages.

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(Published in 4 volumes)

J. N. Stephenson, editor-in-chief

Volume I: The Preparation and Treatment of Wood Pulp. 337 illustrations, 90 tables, 1043 pages. Volume II: The Preparation of Stock for Paper Making. 194 illustrations, 13 tables, 587 pages. Volume III: Manufacture and Testing of Paper and Board. 450 illustrations, 945 pages. Volume IV: Auxiliary Paper Mill Equipment. 343 illustrations, 36 tables, 732 pages.

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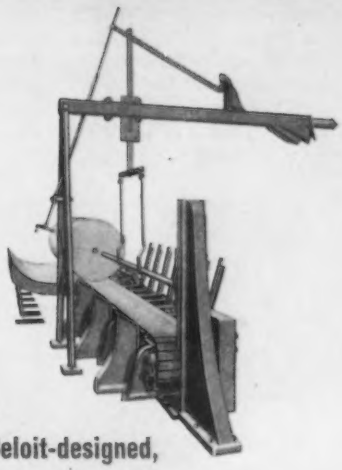
BELOIT UNIT MODERNIZATION

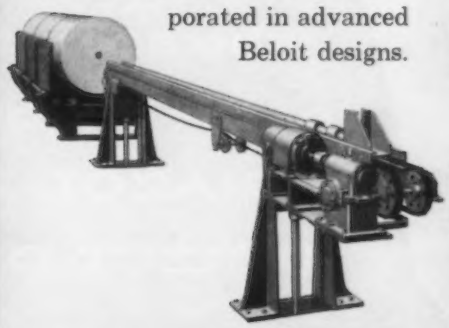
ONE OF A SERIES SHOWING TYPICAL BELOIT SOLUTIONS TO COMMON MILL PROBLEMS



Beloit-designed,
completely automatic

Roll and Shaft-handling equipment

Rapid shaft removal—finished roll delivery—shaft dressing and shaft return—all are incorporated in advanced Beloit designs.



» **ACT!** *For full information about Beloit roll and shaft-handling ask a Beloit Sales Engineer, or write to Beloit Iron Works, Beloit, Wisconsin.*

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a clamping plate. Housings are designed for mounting in one position only.

Worms are cut integral with shaft and ground to a high-surface finish on both thread flanks. Shaft extension diameter is especially large to permit increased overhung load capacity. Heat treating is by means of an acetylene-oxygen flame at 330°F. The result is a high degree of hardness throughout the entire thread thickness and well below the worm's root diameter. This hardness pattern is carried out in the worm shaft extension past the oil seal wearing surface to prevent the shaft being worn and damaged by its oil seal.

Gears have centrifugally-cast bronze rims with a high tin-nickel content, made integral with a cast iron center. Bronze rims are centrifugally-cast integral with cast-iron centers. Gear shaft extension diameters are especially large to permit greatly increased overhung load capacity.

Bearings are Timken taper roller type on both worm and gear shafts. Worm bearings are mounted directly in the housing bore for greater rigidity.

Cleveland has the original master worm in stock for each size and ratio of worm gearing. Therefore, it is not necessary to replace worms and gears in sets. A new gear will operate with an old worm and vice versa. Full information is available on request to The Cleveland Worm & Gear Co., 3300 East 80th Street, Cleveland 4, Ohio.

Loader Features Single Lever Control

A front end wheel loader, the Model TL-20 TractoLoader, announced by Allis-Chalmers, incorporates an exclusive single-lever speed and direction control. The operator can choose any of six speed and direction combinations by operating one lever. An automatic clutch cut-off permits full engine power to be delivered to the hydraulic system when brakes are applied. The 23,150-lb. unit has a carry capacity of 9,000 lbs. It is powered by a 130-h.p. Allis-Chalmers diesel engine.

Six bucket sizes ranging from 2¼ to 5 cubic yards are available. Reinforced with wrap-around cutting edges, the buckets tip back 40° at ground level for rapid loading. For stability while traveling, a bucket can be tipped back to an angle of 45° when it is only 14 inches above the ground. Maximum dumping angle at full raise is 47°. Maximum dumping clearance under the hinge pan is 11 feet 1 inch. Dumping clearance depending on bucket size ranges from 7 feet 11 inches to 9 feet 3 inches. Maximum dumping height reach from the front of the tires to the cutting edge, varies from 2 feet 7 inches to 3 feet 7 inches.

Top travel speed in either direction is 30 m.p.h. The tractor is equipped with a 3.5 to 1 torque converter, rear wheel power steering, four-wheel power brakes that can be operated by either right or left foot, and a separate positive-locking mechanical parking brake.

The unit's completely enclosed hydraulic system includes 3 filters—

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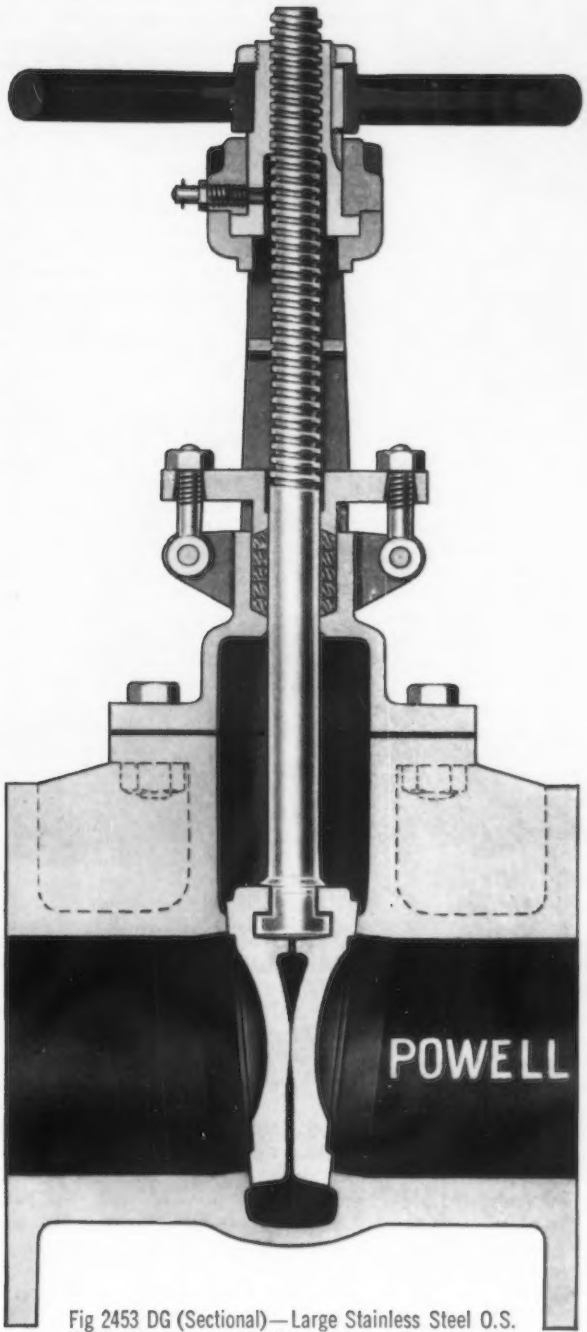

Fig 2453 DG (Sectional)—Large Stainless Steel O.S. & Y., Gate Valve. Available with interchangeable solid or split wedges. Wedges are fully guided throughout their travel.

Fig. 2633—Large, Stainless Steel Swing Check Valve for 150 W.P. Sizes, 2" to 12".

Powell offers valves available in the largest selection of metals and alloys to handle practically every corrosive fluid—valves that can be depended upon to control flow in most severe services—because of

Powell advanced design and engineering.

Solid and double wedge discs of gate valves are interchangeable. They are precision machined and fitted, and are accurately guided throughout their entire travel. This prevents drag of the disc over the seat faces, eliminating wear of seating surfaces and stops undue vibrational noises.

O.S. & Y. Valves—Stems are threaded and guided through a bronze bushing in upper yoke. (Bushings made of other alloys can be supplied on special order.) A compression lubricant fitting in upper yoke is provided to lubricate the stem and bushing threads and to reduce wear. A convenient shelf is cast on the inner sides of yoke arms for suspending the gland when renewing the packing.

All 150# valves are regularly packed with Teflon Packing. Globe, Angle and "Y" valves are available with metal or Teflon discs.

Globe, Angle, Gate and "Y" valves are back seated for repacking under pressure when fully open.

Consult your local Powell distributor or write directly to us.

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full-flow micronic, full-flow magnetic, and full-flow wire mesh. Two air filters are standard equipment. Planetary axles are pin connected to a one piece welded frame. The axles have high-traction differentials.

Downspout Elbow Has Built-In Grade

A fibre-pipe elbow to connect downspouts to underground dry well pipes has been introduced by Bermico Division of Brown Co. The elbow has a 100° angle which automatically provides the correct slope for leadoff pipe lines. It is made with a sharp elbow instead of the usual sewer pipe "quarter bend" fitting commonly used for the purpose. Its use facilitates leadoff and dry well installations.

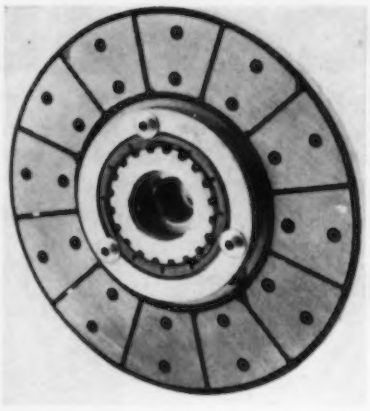
Available in three-inch diameter,

the fitting comes complete with coupling to attach to the leader and tapered male end to attach leadoff pipe. Details may be obtained by writing Bermico Pipe, Box 131-DL, Boston 14, Mass.

Spline Drive Armatures For Heavy Duty Uses

A line of spline drive armatures for use on integral horsepower electric clutch-coupling and brake applications where shock-loading or vibration-loading are problems is announced by Warner Electric Brake & Clutch Co., Beloit, Wis. Assemblies are available in 8, 10, 12 and 15-inch diameters.

No mounting adjustment is required. The splined armature adapter made of Meehanite is bolted to the



armature. The internal involute spline which is cut in the adapter is lubricated with molybdenum disulfide for initial break-in and needs no further lubrication. The alloy steel splined hub has a tapered bore into which the tapered bushing is pressed. A retainer ring at one end of the hub prevents the armature from being backed off too far.

Automatic compensation for magnet and armature wear is provided by the autogap spring. The autogap spring fits over the splined hub and moves with the armature on the spline toward the magnet to compensate for wear, yet always maintains an automatic 1/32-inch gap when the unit is disengaged. Compared with drive pin designs, the spline drive armature assemblies are said to withstand greater shockloads and vibration because of greater bearing surface. An 8-inch unit, for example, offers the projected area of 20 teeth and a 12-inch unit 36 teeth.

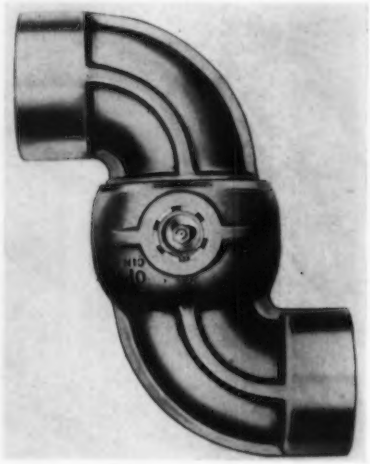
Copolymer Resin Has Adhesive Applications

Resin D-243 is a borax stable polyvinyl acetate-dibutyl maleate copolymer emulsion, announces Shawinigan Resins Corp. Films cast from Resin D-243 have the usual advantages associated with internal plasticization, such as low temperature flexibility without need for additional plasticization and improved film forming characteristics.

Resin D-243 possesses good freeze-thaw and mechanical stability. Stability on dilution with water is reported to be very good, as is compatibility with multivalent cations and organic solvents, such as alcohol. Emulsion characteristics include: total solids, 54.5 per cent minimum; emulsion viscosity @ 25°C. (Brookfield No. 3 spindle @ 30 r.p.m.), 1000-1400 c.p.s.; density, 9.03 lbs./gal.; particle size, average about 0.5 microns, between 0.2 and 1.2 microns; surface tension, 41.8 dynes/cm; heat seal temperature, 170-180°F.; tensile strength @ 70°F. and 50 per cent r.h., 1530 p.s.i.; 100 per cent modulus @ 70°F. and 50 per cent r.h., 1310 p.s.i.; elongation at break @ 70°F. and 50 per cent r.h., 180 per cent.

Resin D-243 can be compounded with defoamers, thickeners, hardeners, tackifiers, plasticizers and other modifying agents. Its borax compatibility makes the resin of interest in fire-retardent adhesives and coatings. Preliminary investigation shows that it has promise as a beater additive in paper manufacturers.

Keep your eye on our Classified Advertising Section



Swing Joints Of Stainless Steel

Stainless steel swing joints, now available from OPW-Jordan, may be used as elbows in pipe lines wherever flexibility and rigidity are both needed. They are said to easily withstand tough, corrosive conditions and prevents product contamination. The series 7400 Stainless Steel Swing Joints are available in 1¼ inch — 4 inch sizes; in 17 different styles. Cast in 316 stainless steel and designed for 1,000 p.s.i. service. Temperature determined by O-Ring seal material used.

O-Rings are available in a variety of materials: Viton, Buna N, Neoprene, Butyl and Teflon. Complete information is available in Bulletins F-8 and SRBC 52-59. Write OPW-Jordan, 6013 Wiehe Road, Cincinnati 13, Ohio.

Pulp Paper and Board Mill Maintenance

Based on actual in-plant experience and prepared by well known men in the paper industry, this 126 page book brings you in easy to read language procedures for plant maintenance of kraft mills, semi-chemical mills, bleach plants, fourdrinier and cylinder machines, stock preparations equipment, and other machinery used in pulp and paper making. Price $2.50.

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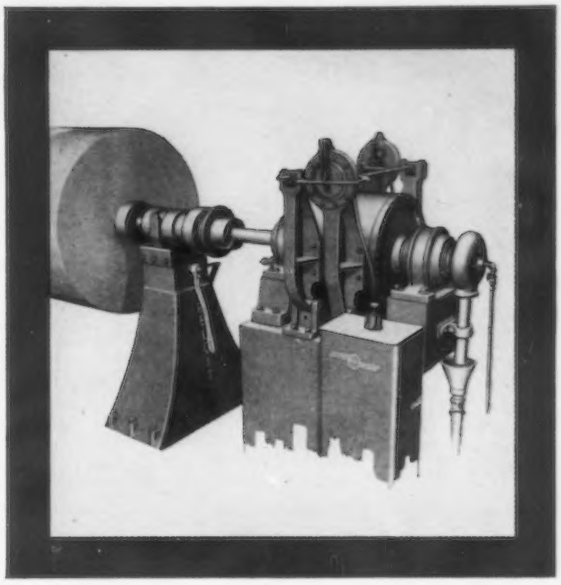

Looking for dependable unwind tension control?

Beloit time-tested Unwind-stand Brake

Investigate this superior equipment—unquestionably the finest unwind-stand control on the market today. Beloit brakes can be manually controlled or furnished with Beloit automatic Tru-Tension. Tru-Tension provides for complete roll inertia compensation, maintaining selected sheet tension for winder sets of uniform hardness.

» **ACT!** *Write for full information—or let a Beloit Sales Engineer show you how easily you can add the Beloit Unwind-stand Brake to your machine. Write to Beloit Iron Works, Beloit, Wisconsin.*

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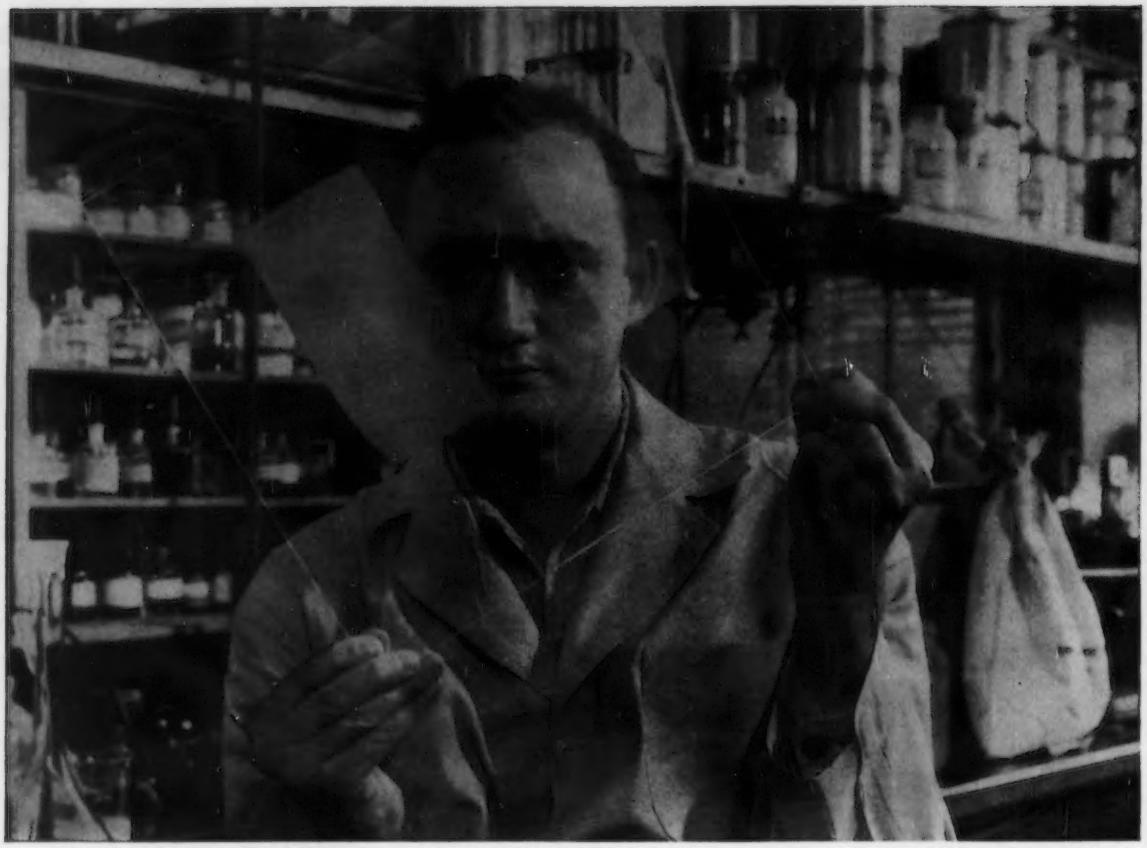

Smears of size on glass show clarity of Ten-O-Film, right, almost invisible, compared with conventional starch, left.

Sure way to CLEAR, UNIFORM COATING

The highest degree of coating quality can be achieved with the new, improved Ten-O-Film starches.

These new starches possess unexcelled clarity, uniformity and film-forming properties. They are available in a series of fluidities to meet your exact requirements. Because of their high degree of viscosity stability at high solids, Ten-O-Film starches reduce setback and maintain adhesive strength, assure good performance. At lower concentrations Ten-O-Film starches assure superb structural film continuity and excellent results.

For technical assistance in selecting the TEN-O-FILM starch best suited to your needs contact our nearest sales office or write direct.

TEN-O-FILM® starches

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Superior Doctoring calls for Quality Blades

That is why it's so important to buy doctor blades from Lodding. Here, the manufacture of blades is big business. Craftsmen follow each of the many steps of manufacturing with the precise skill acquired only from extensive, specialized experience.

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Lodding Blades are available in any size, in the material best suited for any paper machine roll application . . . K MONEL . . . ALLOY STEEL . . . STAINLESS STEEL . . . PHOSPHOR BRONZE . . . LAMINATED PLASTIC . . . ABRASIVE.

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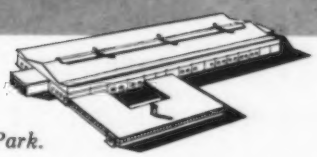
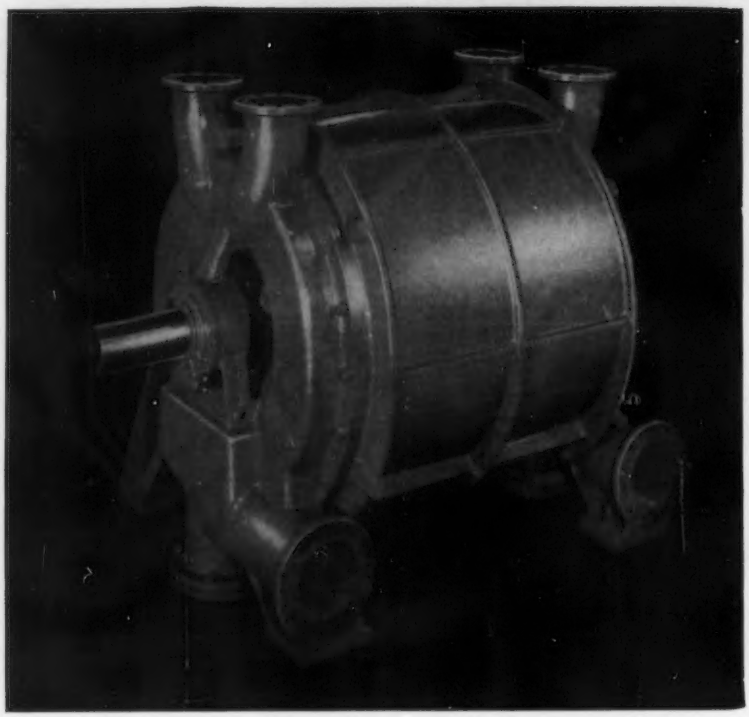


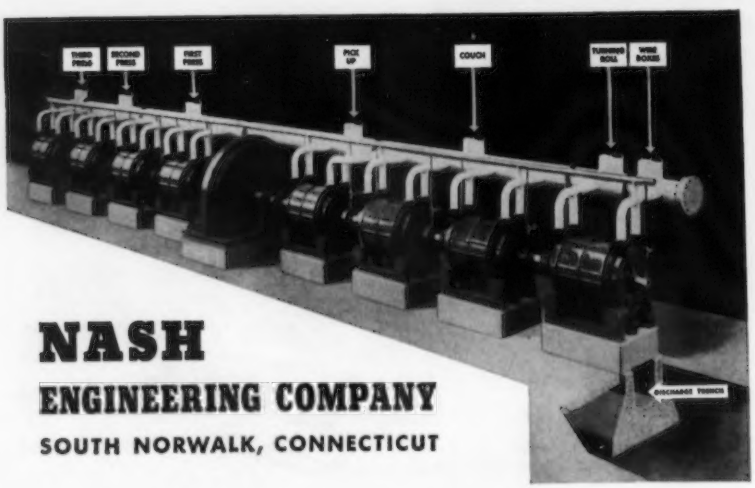
We welcome your inspection of our new plant located in Worcester's Auburn Industrial Park.

This New Nash Vacuum Pump Offers Four Separate Suctions and Vacuums Simultaneously



The Nash 5308-A has four separate suction inlets, each of which functions independently of the others. This offers the machine operator great flexibility, since these may be used in any desired combination to produce a variety of capacities and vacuums.

Picture below shows simple drive possible and flexibility of piping permitting capacities to exactly fit requirements of different sections of the paper machine.



NASH
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OBITUARIES

Walter C. Carlson, 83, former president of the old Milwaukee Paper Box Co., died Sept. 4 in Milwaukee Hospital. He was the first president of the National Paper Box Manufacturers' Association. He had been associated with various paper box manufacturing concerns until 1905 when he organized the Milwaukee Paper Box Co.

Edward C. Hilfert, 72, president of the Riverside Paper Corp., and a director of the Spaulding Pulp and Paper Co., of Oregon, died September 4 in Appleton, Wis. He was an official of the National Ass'n. of Paper Manufacturers.

Carl A. Sholdebrand, 66, of Dundee, Ore., died August 26.

His experience included posts as chemist in Swedish pulp mills; chemist and superintendent in Canadian pulp mills; service engineer, G. D. Jenssen Co.; service engineer, Chemipulp Process Inc.; sulphite superintendent at Hawley Pulp and Paper Co. Oregon City, Ore. At the time of his death he was plant superintendent at Spaulding Pulp & Paper Co., Newberg, Ore.

Christian K. Berg, 84, retired superintendent of the Marathon Corp. at Marinette, Wis., died on September 10.

John H. Stortz, former owner of the John H. Stortz Paper Box Manufacturing Co., died September 19 in Graduate Hospital, Philadelphia, Pa. Mr. Stortz was graduated from Towne Scientific School of the University of Pennsylvania with the class of 1912.

Ralph Norman Fowler, 86, a former chairman of the board of the Hampden Glazed Paper and Card Co. of Holyoke, Mass., died at his home, 19 Ingersoll Grove, September 18.

An employee of the Holyoke concern for more than 60 years, Mr. Fowler served as its superintendent, general manager, treasurer and president.

Lowell M. Newman, 55, plant engineer at the Crystal Tissue Co. and a prominent civic leader of Monroe, Ohio, died September 14 while attending a meeting at Monroe City Hall.

New automatic monitor guards the consistent purity of Westvaco® CHLORINE

Among the most modern devices for controlling chlorine cells is Westvaco's automatic chromatographic analyzer. Keeping a constant eye on the chlorine stream, it makes continuous quantitative analyses just prior to liquefaction to detect and record the contaminating presence of inert gases.

This is another of the careful quality controls installed during our recent multimillion-dollar plant expansion and modernization program. It's one more reason why we are now supplying more and better chlorine than ever before.

From our strategic location at South Charleston, W. Va. we are in excellent position to give you fast, dependable service throughout the East, mid-South and Midwest. Let us quote on your needs now.

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Write for full information and sample of Thiele Kaolin coating or filler clay for your particular use.

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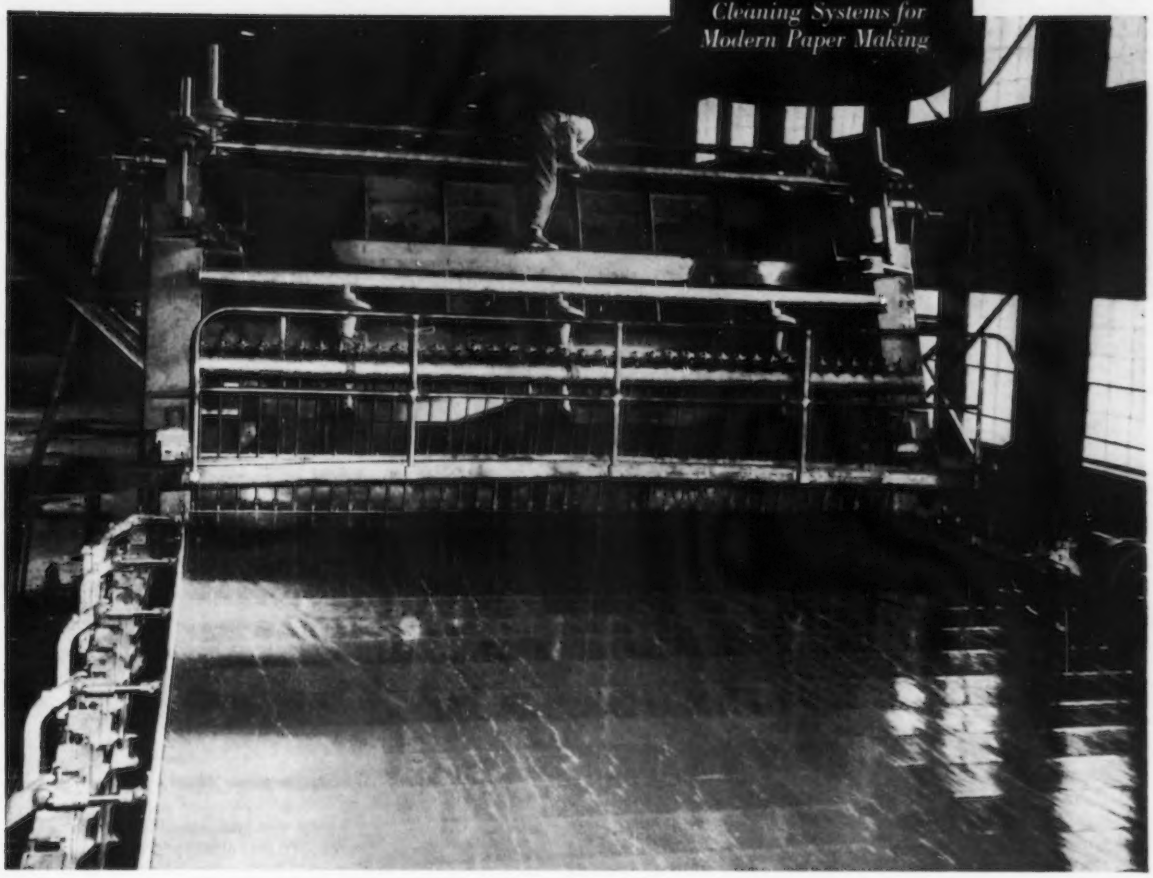
Modern Cleaning Systems for Modern Paper Making



Fourdrinier wire life increased 40% by mechanized continuous cleaning

Changing Fourdrinier wires about every 20 days cost one mill over $13,000 yearly.

Mechanizing the wire cleaning and using Oakite Compound 85 made a big difference. Now, the wires average 28 days—a 40% increase in life. Savings: about $5,000 yearly in wire costs alone, *plus* the time and work saved with fewer changeovers.

How it was done. On recommendation of the Oakite man, the mill adopted an in-place cleaning system using Oakite Compound 85. The wire is cleaned without manual brushing. Results: wire is thoroughly cleaned. It's replaced only because it fails mechanically, never because of cleaning damage. In fact, the wire supplier remarked he'd never seen wire returned in such good shape.

How you can benefit. Ask your Oakite man to help you cut cleaning costs, too. He's well qualified to help you develop time-and-money-saving cleaning *systems*.

Call him in; or write for Bulletin B-4591. Oakite Products, Inc., 68 Rector Street, New York 6, New York.

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Modern Cleaning Systems Keep Downtime DOWN

PJT NEWS OF SUPPLIERS

T. E. Casselman

J. L. Hendrickson

Stone & Webster Corp. has named Theodore E. Casselman, Jr., former assistant engineering manager in the Boston office, manager of the New York office, it was announced by T. Cortlandt Williams, president.

Mr. Casselman joined Stone & Webster in 1940 after working on the engineering staffs of Worthington Corporation in Harrison, N. J., Jackson Engineering Corp., Tulsa, Okla., and American Locomotive Co. in New York.

Starting as a project engineer he has worked on the design of many chemical and petrochemical plants built by Stone & Webster in the United States and various parts of the world. He was promoted to chief engineer of the Chemical Division in 1956 and made assistant engineering manager in 1958.

Frank W. Egan & Co., Somerville, N. J., has appointed John L. Hendrickson controller. Mr. Hendrickson, who received his B.A. at Tufts College and M.A. in business administration at New York University, was previously employed as a senior accountant at Lybrand, Ross Bros. & Montgomery in New York.

Egan manufactures machinery and equipment for the paper converting and plastics industries.

American Cyanamid Co. has appointed Charles R. Witschonke manager of paper chemicals research for its Industrial Chemicals division.

Dr. Witschonke joined Cyanamid in 1945 as a research chemist at the company's Bound Brook laboratories and since has served in a variety of research and technical service posts at Bound Brook and the firm's central research headquarters at Stamford, Conn. Until his new appointment, he was manager of refinery and mining chemicals research at Stamford.

In his new position, Dr. Witschonke will direct research on a wide range of synthetic resins, wax emulsions, sizing agents and specialty chemicals used in the production of paper.

He is a graduate of Kalamazoo College and received his doctorate in physical chemistry from Brown University in 1941.

Farrel-Birmingham Co., Inc., announces the appointment of Harlan J. Hauser as manager of field sales, to succeed D. Wheeler Clark. He has also been appointed to the company's management committee and has been transferred to the general offices in Ansonia, Conn.

Mr. Hauser first joined the Farrel organization in Buffalo in 1941 and was transferred to the sales department in Ansonia in 1944. For the past two and one-half years he has been assistant sales manager of the Consolidated Machine Tool Division and sales manager of the Watson-Stillman Press Division at Farrel's Rochester plant.

H. J. Hauser

B. E. Gallagher

Bailey Meter Co. announces the appointment of B. E. Gallagher as resident engineer in Indianapolis, Ind., subdivision of the company's Chicago district. Gallagher's address is 4537 North Edmondson Ave., Indianapolis 26, Ind.

Mr. Gallagher joined the company in 1946 as an engineering trainee, and was assigned to the Chicago district after completion of his training. A graduate of Purdue University, he holds a bachelor of science degree in electrical engineering.

Research-Cottrell, Inc., Bound Brook, N. J., has appointed Bruno Gruenwald as special project engineer for mechanical dust collectors. In this capacity he will coordinate sales and service of Cycle-trells and related equipment including the recently announced involute type as well as the multiple tubular design.

Mr. Gruenwald has a broad background of experience in power plant design and dust collection. His 11 years of experience has covered all phases of the manufacture and operation of dust collecting equipment.

Alvin H. Johnson & Co.
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FLUIDICS* AT WORK

Checking clarified effluent of the Permutit Colloidair Separator at the Homasote Company

How to side-step a public health hazard ... and step into big new savings

Maybe you have a problem similar to the one that confronted the Homasote Company, Trenton, N. J.

They make high-density wood fiber insulation board. The process *could* create a waste disposal problem and impair the company's good community relations.

The answer found by Homasote turned out to be more than just a waste treatment system. It is also a valuable way to save money, through reclaimed product and water.

The Permutit Colloidair Separator is behind this accomplishment.

Saves product. White water feeds into the Colloidair, where a "bubbling-out" process raises the fibers to the surface. These fibers are scraped off and reclaimed.

Saves water. No water is wasted in this closed-circuit operation. Colloidair clarifies it for Homasote's re-use in pump glands, stuffing box seals, and for general cleanup.

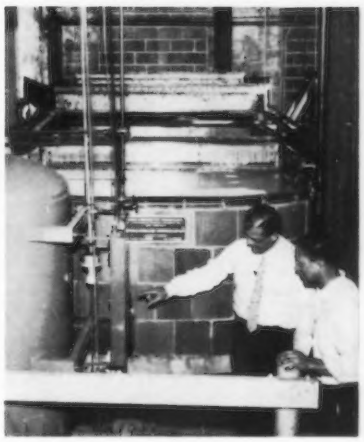
Saves heat. The reclaimed water holds most of its heat during the clarifying process. This saves the expense of re-heating for re-use.

Easy to use. Colloidair works almost by itself. The operator does little more than periodically charge chemical tanks.

Homasote is getting these benefits today . . . when would YOU like to start?

We will be glad to run lab and/or pilot plant tests to show just what the Permutit Colloidair Separator can do with your white waters and/or waste waters.

Save your public relations . . . and your money. Get more information on Colloidair by writing our Permutit Division, Dept. PT-99, 50 West 44th Street, New York 36, New York.



Observing Colloidair's chemical feed at Homasote

*FLUIDICS is a new Pfaudler Permutit program that provides a modern, imaginative approach for handling and processing liquids and gases more profitably.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS . . . the science of fluid processes

Beloit Iron Works has appointed W. E. Watson vice president and general plant manager.

Mr. Watson joined the paper machinery manufacturer December 1, 1956. Prior to that time, he was general manager of the Beloit works of Fairbanks, Morse and Co. He earlier was manager of Fairbanks-Morse's St. Louis plant and the pump manufacturing division.

Shuler & Benninghofen announce a contest. If some famous place, location, landmark or view reminds you of some feature claimed for Hamilton Felts and you explain why in a few words and send it to "Ham Feltz", Shuler and Benninghofen, Hamilton, Ohio, you may be one of 12 happy papermaker winners of a new 1959 or 1960 Shakespeare Spin-Cast Rod and Reel, depending upon the month your idea is used in its advertising by Shuler and Benninghofen. It is not necessary to send in a photo. Merely a postcard or letter will suffice.

Everyone connected with a paper or board making company who sends in a suggestion will be awarded a famous Rex Spoon fishing lure. In this contest you can't lose!

As idea starters, executives of Shuler and Benninghofen suggest that you look at their more recent ads. For instance: the Golden Gate Bridge, Venice and Niagara Falls are all reminders that Hamilton Felts are "engineered to solve water problems too"; Old Faithful Geyser is a reminder that "Hamilton Felts are dependable too"; a grove of California giant red woods is a reminder that "Hamilton Felts last a long time, too."

As there is a new contest each month for 12 months, it is suggested that you send in your suggestions both early and often. One person can win only one Spincast Fishing outfit, however.

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Aug. 15	Aug. 22	Aug. 29	Sept. 5	Sept. 12
1959	96.4r	96.6r	95.5	95.8r	78.4
	Aug. 16	Aug. 23	Aug. 30	Sept. 6	Sept. 13
1958	91.0	90.0	88.1	69.4	92.0

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1959	87.8	90.5	93.2	94.4	95.3‡	95.6‡	84.6‡	95.9‡	—	—	—	—	—
1958	86.9	89.5	89.5	88.4	87.2	87.2	75.3	89.6	86.5	91.6	90.4	83.1	87.1

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1952	1953	1954	1955	1956	1957	1958	1959
Year to Date	90.4	92.1	91.2	94.4	98.2	91.1	85.6	91.2
Year Average	88.6	92.3	91.6	94.0	97.9	90.9	87.1	—

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

	Aug. 15	Aug. 22	Aug. 29	Sept. 5	Sept. 12
1959	96	95	96	97	76
	Aug. 16	Aug. 23	Aug. 30	Sept. 6	Sept. 13
1958	93	92	95	73	97

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1959	86	89	94	93	95	95	83	96	—	—	—	—	—
1958	84	86	87	84	85	86	76	93	90	95	93	77	86

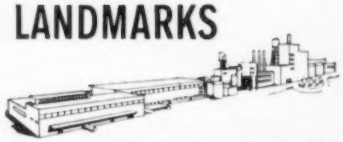
† *Per cents of operation based on "inch-hours" reported on a 6-day basis to the National Paper board Association.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	THIS WEEK ENDING *Sept. 12, 1959	LAST WEEK ENDING Sept. 5, 1959	CUMULATIVE TO DATE Jan. 1 to Sept. 12, 1959 incl.
% Activity	76%	97%	92%
TOTAL	250,491	335,940	11,045,168
Liner	88,292	116,331	3,839,180
Corrugating Material	41,548	51,525	1,683,525
Chip & Filler Board	4,157	4,788	183,449
Total Containerboard	133,997	172,644	5,706,154
Folding	41,649	61,058	1,986,873
Set-Up	11,319	12,359	419,189
Special Food Board	18,087	29,236	1,001,759
Other	45,439	60,643	1,931,193
Total Boxboard	116,494	163,296	5,339,014
Total Orders			
Received	264,056	374,535	
Unfilled End of Week	567,295	550,083	

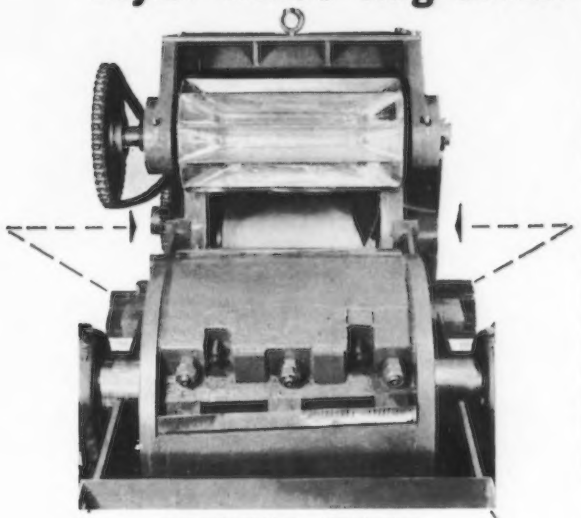
* Includes Labor Day Holiday.

CHAS. T. MAIN, INC.
ENGINEERS
PROCESS STUDIES, DESIGN, SPECIFICATIONS, CONSTRUCTION SUPERVISION
PULP AND PAPER MILLS
STEAM, HYDRAULIC AND ELECTRICAL ENGINEERING
REPORTS, CONSULTATION, VALUATIONS
BOSTON, MASSACHUSETTS
CHARLOTTE, NORTH CAROLINA

PRODUCTIVE LANDMARKS

of Economic Growth
Rust has designed and constructed plant facilities increasing pulp and paper production. Ask for details.
THE RUST ENGINEERING CO.
PITTSBURGH 22 • BIRMINGHAM 3

Serving Timber Industry since 1910
Timber Estimators and Foresters
C. D. SHY & COMPANY
1130 Commerce Title Building
Memphis 3, Tennessee

This Taylor-Stiles Rag Cutter



assures more uniform cutting-and is PRACTICALLY JAM-PROOF

Taylor-Stiles Rag Cutters have several features that make them practically jam-proof and, if a jam does occur, that speed up cleaning. These features mean real savings for you by sharply reducing down time.

A single large diameter feed roll extended through the sides of the feed trough and mounted on rigidly connected pivoted arms holds the stock firmly and produces uniform cutting. End plates on the single feed roll overcome any tendency of the rags to disperse outwardly. The space between the cutting element of the frame has been widened as a further measure to prevent jamming.

If, for any reason, a jam should occur, the feed roll can be lifted up out of the way without removing any parts, since no springs are used. The photograph above shows the feed roll lifted up by crane. The crane hook is visible in the top of the picture. This makes the end of the feed apron, the bed knife and the cutting assembly instantly accessible for cleaning.

Several paper mills which have modernized with the new 500 series Cutters report fewer jams and greatly reduced downtime, if a jam should occur.

It will pay you to learn more about the improved Taylor-Stiles Rag Cutters.

Write today for our 4-page, 2-color Bulletin 214, illustrating and describing these improved machines.

TAYLOR, STILES & COMPANY

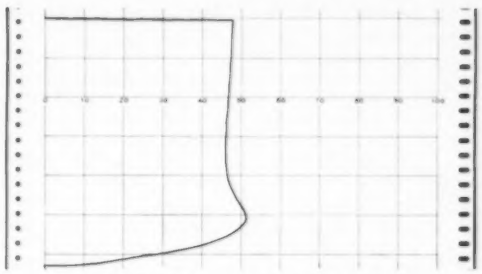
9 Bridge Street Riegelsville, New Jersey

TEST TIPS

FROM THE SCOTT LABORATORY

TEST TENSILE STRENGTH

with the Scott Model CRE Tester



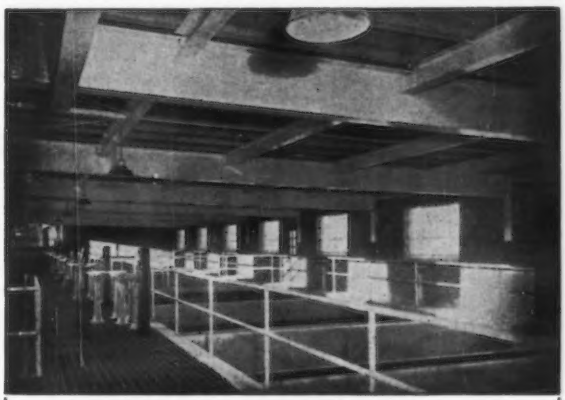
Yield Point 52 lbs. Break Point 48 lbs.

The electronic chart recording above clearly indicates that the yield point of a sample plastic film is actually *higher* than ultimate tensile strength. Note, too, how graphic precision of electronic weighing reveals "sag-back", or reversion, while stress is continuing. Highly critical quality evaluations such as this are now made possible—and economically feasible—with the Scott Model CRE tester. Write for "CRE Brochure."

SCOTT TESTERS

THE SURE TEST...SCOTT!

SCOTT TESTERS, Inc., 51 Blackstone Street, Providence, Rhode Island



Concrete Gravity Air-Water-Wash type water Filtration Plant producing, at low cost, water with turbidity 0, color under 5 and iron 0.05 p.p.m. Fe.

OTHER PRODUCTS

Demineralizing Plants
Water Softening Plants
Pressure Filter Plants

and

All other types of water treating systems, including strainer valves, air wash systems, filter sand and anthracite beds and all filter repair and replacement parts. Over 50 years experience building new and modernizing old water treatment plants.

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CLAYTON 4, NEW JERSEY

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Westvaco manufactures its products from virgin chemical pulps, and carefully maintains precise uniformity and quality standards . . . your assurance of top performance.

Printing Papers . . . Coated and uncoated letterpress, offset and gravure.

Writings . . . Bond, mimeo, duplicating, ledger and multipress.

Bristols . . . Uncoated index and postcard, coated two sides and coated one side board.

Label and Lining Papers . . . Coated and uncoated letterpress, offset and gravure, coated washproof for letterpress and gravure.

Converting Papers . . . Envelope, tablet, drawing, coating raw stock, register bond, lace, and place mat.

Bleached Boards . . . Cup, coated and uncoated carton board, frozen food container, milk bottle, file folder and tag.

Kraft Papers . . . Bag, multiwall sack, envelope, asphalting, impregnating, waxing, and new CLUPAK* stretchable paper.

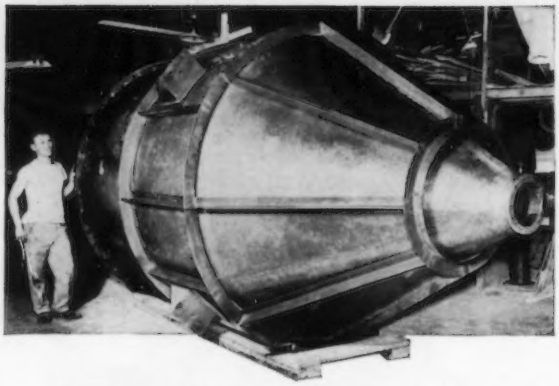
Containerboard . . . Linerboard and corrugating medium.

Market Pulp . . . Bleached and unbleached sulphate.

Write: West Virginia Pulp and Paper Company, 230 Park Ave., New York 17, N.Y.

**CLUPAK, Inc's. trademark for extensible paper, manufactured under its authority.*

West Virginia Pulp and Paper



du Verre CONSTRUCTION GIVES COMPLETE CORROSION CONTROL . . . inside and out!

du Verre resin bonded Fiberglass construction is the answer to corrosion-free, trouble-free mill process equipment. Ducts, Hoods, Tanks, Fans, Vessels of any description can be easily fabricated and field erected at surprisingly low cost. du Verre Construction is strong, light-weight and is offered in a wide variety of resin formulations.

Unlike coatings or linings, du Verre resin bonded Fiberglass is homogeneous in structure giving complete protection inside and out. Painting and maintenance are not required.

Eliminate rust, corrosion and contamination in your mill. Investigate du Verre Construction for your process equipment. Write for your free copy of Bulletin No. 100.

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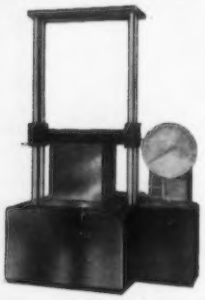
TESTING MACHINES, INC.

1079 Testing Machines available from TMI . . .
with Special Emphasis on Container & Packaging Testers

ONE EXAMPLE:



SAVE MONEY — INCREASE SALES —

Test your containers and packaging. Determine and maintain physical quality beyond any question.

TMI Container Testers are used throughout the world in the largest plants and commercial testing laboratories. They offer:

- **Long life and trouble-free service.**
- **Reasonably priced.**
- **Complete with all desired features — no "extras" needed now or later.**
- **Accurate, easy to verify, dead weight system. No springs. No complicated electronic circuits.**
- **Easily operated by unskilled personnel.**
- **"Quality and performance proven" over the years.**

Write for complete details.

Ask for the New 224 Page TMI Catalog and Register of Testing Machines.

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Paper men ourselves, and the only recognized professional specialists in the world in our particular field, we assist responsible paper men to accelerate their careers by uncovering and developing THE SPECIFIC SITUATION that most exactly fits the needs of each individual we serve.

If you seek to better yourself, and your performance to date entitles you to our endorsement, we can and will help you. Contact us in absolute confidence for information regarding procedure.

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BETTER POSITIONS

$6000 to $35,000. Want a substantial salary increase, more opportunity or different location? This national 48 year old service connects you with best openings. You pay us only nominal fee for negotiations; This we refund when employer pays placement fee. Present position protected. In complete confidence, write for particulars. R. W. Bixby, Inc., 563 Brisbane Bldg., Buffalo 3, N. Y. S-28

Openings for two qualified young sales-engineers representing large reputable company on sales of commodities to paper mills. Must have education or experience with papermaking, preferably stock preparation. Salary, expenses and bonus for growth sales. Exceptional opportunities for industrious, intelligent, outgoing performers. Flexibility and desire to travel to do the job is mandatory. Resumes will be kept confidential. Write to Box 59-270 care Paper Trade Journal.

S-28

Chemical Engineer or Chemist

Splendid opportunity with leading coated paper manufacturer in Lake States area. Several years industrial experience desirable but not essential. Activities will include laboratory and mill research and development. Send detailed resume to: Box 59-261, c/o Paper Trade Journal.

S-28

Help Wanted

CHEMIST
CHEMICAL ENGINEER
or
PULP AND PAPER TECHNOLOGIST

WE HAVE AN OPENING IN OUR PULP MANUFACTURING DEPARTMENT FOR AN EXPERIENCED CHEMIST, CHEMICAL ENGINEER OR PULP AND PAPER TECHNOLOGIST. PULP AND PAPER MANUFACTURING EXPERIENCE DESIRABLE. THIS IS A POSITION OF RESPONSIBILITY WITH ROOM FOR ADVANCEMENT. STARTING SALARY BASED ON EXPERIENCE AND QUALIFICATIONS. ALL APPLICATIONS WILL BE HELD IN STRICT CONFIDENCE. PLEASE SUBMIT SUMMARY OF EDUCATIONAL BACKGROUND, EXPERIENCE, AND SALARY REQUIREMENTS TO:

EMPLOYMENT OFFICE

The Champion Paper and Fibre Company

CANTON, NORTH CAROLINA

O-19

EXCELLENT OPPORTUNITY FOR

Technically trained man for technical sales-service customer contact work in coated printing papers. Background should be in pulp and paper. Printing knowledge helpful but not necessary. Position demands a personable and tactful individual with desire to progress in an expanding organization. North-central mill location. Please send resume including education, experience and salary requirements. All replies confidential. Reply Box 59-262 care Paper Trade Journal.

N.C.

WANTED

Chemists and Chemical Engineers

Excellent opportunities for graduate chemists and chemical engineers, preferably with up to three years experience in pulp and paper, to work in: (a) Technical Service to manufacturing, (b) Research and development. Fields of activity include (1) kraft pulping, bleaching, and waste treatment, (2) manufacture of high-grade printing and book papers.

Send resume to:

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1—54" & 1—49" 1-color Gravure Presses
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1—48" 4-color Cottrell Heinrich Press, 3—Flexo, 1—Gravure
1—42" 4 color Kidder Standard Flexographic Press
1—40" Wide 5 Unit Koenig & Bauer Rotogravure Press
1—33" 6-color Cottrell-Heinrich Flexo
1—18" 2-color Potdevin Oil Ink Roll to Roll Press
2—18" 3 & 4 color Martini Flexo
1—10" 4-color Roto Press.
2—9" x 12" 2 color New Eras

POWER PAPER CUTTERS

Seybolds: Dayton: 56" & 35"; 20th Century: 64"; 54" & 38"; Holyoke: 55"; 10Z: 65", 50"; 44"; 7Y: 34"; 3Y: 32"; Oswegos: 36"; Dexters: 50", 44" & 32"; C & P: 44"; National: 44"
1—84" Seybold Precision

CAMACHINES

1—96" Cameron #18
1—82" 10-10
1—72" 10-10A
1—72" 10-11
1—72" Shear Cut, Type 10-04-8, 40" diam. rewind
1—62" Type 6 Stanford Web Guide & Variable Speed Drive
1—62" 40-1-AF
1—62" Type 42, for small rolls
1—52", & 1—42" Model 24-7.
1—42", 50" & 62" Type 6
1—55" & 1—65" Type 10

OTHER SLITTERS

1—106" Langston (60" Diameter Rewind)
1—82" Langston Type B
1—60" Langston Type A
1—60" Langston Type AA
1—60" Inman With Reeves Drive
1—52" Meisel (Shear-Cut)
1—50" & 1—60" Knowlton Board Slitter (Heavy Duty)
1—50" Kidder Mod. SLN Shear-cut
1—40" Langston "Type A" (Shear-Cut)
1—36" Kidder SLN (Shear Cut) Fully equipped for converting adding machine & teletype rolls.
2—24", 1—30", 1—36" & 1—40" Kidder S.L. Shear cut
1—62" Johnstone

MISCELLANEOUS MACHINES

1—79" Moore & White Sheeter with 10 roll backstand and motor
1—55" Beck CCSH A-S Angle Sheeter
1—55" CSH Beck Sheeter with automatic layboy
1—45" CCSH-5 Beck Jogger Table
1—45" CSH Beck Sheeter, Jogger Delivery
1—36" Model CSHD Beck
1—36"-45" and 1—55" Globe sheeters
2—Oliver Caddy Carton Wrappers
1—88" Hamblet Single Sheet Cutter with Layboy
Hamblet Sheeters—32", 44", 48", 64", 104" & 90" Duplex
2—60" Perkins Squeeze Roll Waxers
1—Beasley French Bag Machine. Range: (2" x 2¾" to 6" x 13⅜")
1—Potdevin Model 110-L Cello Bag Machine
2—Potdevin (Model 111-S) F & S Cello Bag Machine, Electric Eye
1—#4 & 1—#5 Potdevin Diamond Shaped Bottom Sack Machines
2—Matador Model #26 & #100 Bag Machines
2—B-10 Bagprint Bag Machines
1—Model-C Cellophane Roto Bag Machine
1—#2CS Weber Cello Pouch Machine
1—Weber Model "CN" Cellophane Satchel Bottom Bag Machine
1—Lawton Model "A" Jr. Toilet Roll Wrapping Machine
1—72" Paper Converting Hard Roll Paper Towel Converter
1—Mercury Hot Paper Cut Machine
3—Seybold: 4—Post Die Presses 2—38" x 24", 48" x 31" & 59" x 32"
2—Sheridans 66" x 44" & 44" x 22"
1—V-Shape 6 oz. Paper Cup Machine
1—Potdevin Duplex Unit for #103 Potdevin Bag Machine
1—27" x 44" Dietz Single-Fold Towel Interfolder
1—New Hudson Sharp No. 10-T Rotary Towel Interfolder
1—Hudson-Sharp C-Fold Towel Machine

S-28

ENGINEERS AND DRAFTSMEN

MECHANICAL ENGINEERING SUPERVISOR

Graduate Mechanical Engineer to age 40 to serve in supervisory capacity in process piping, heating, ventilation, and mechanical design work. Paper mill experience required, with previous supervisory experience desirable. Must have ability to deal effectively with others.

PAPER MILL ENGINEER

Graduate Mechanical Engineer to age 40 with at least five years experience in paper mill design or maintenance.

CHEMICAL ENGINEER

Graduate Chemical Engineer to age 40, with experience in sulphite pulp process. Experience in sulphate pulp and by-product recovery processes desirable but not essential.

POWER PLANT ENGINEER

Graduate Mechanical or Electrical Engineer to age 40 for power plant design and selection of equipment. Experience with turbo-generators and recovery equipment desirable.

GRADUATE ENGINEERS TO AGE 35 ALSO WANTED WITH AT LEAST TWO YEARS EXPERIENCE IN ELECTRICAL, PIPING OR STRUCTURAL DESIGN.

DRAFTSMEN

High School graduates or better for structural, mechanical, electrical, or piping layout. Age to 35 with minimum of three years experience.

These positions provide long-term opportunities. Company is located in eastern Tennessee, in the heart of the beautiful Tennessee Valley. Excellent recreational and residential facilities throughout the area. Very favorable year round climate. Located near Great Smoky Mountains, and short distance from Chattanooga and Knoxville, Tennessee and Atlanta, Georgia. Liberal salary program with periodic merit increases. Complete insurance, retirement and vacation programs are established. All applications will be treated in confidence. Interviews will be conducted in areas of qualified applicants, or selected candidates may be asked to visit offices at Company expense.

Reply immediately, submitting summary of experience and qualifications to:

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1—86" Farrel 8-Roll Calender Stack. A. F. Bearings. Full set of Doctors.
1—8" Pusey & Jones 7-Roll Calender Stack.
1—30" Dia. x 130" Face Farrel Roll Grinder., Complete.
1—5' x 86" Pusey & Jones Yankee Dryer.
1—92" Langston Winder equipped with both score and shear cut slitter devices.
1—86" Warren Winder Complete. Recently rebuilt with new drums and new A. F. Bearings and Housings.
1—110" Pusey & Jones 2-Drum Winder. A.F. Bearings.
1—84" Kamyr Machine. 75 Ton per day.
10—48" x 150" Pusey & Jones Dryers.
7—36" & 72" Pusey & Jones Dryers.
1—E. D. Jones Majestic Jordan No. A-482. S.S. Fillings.
1—74" Seybold Trimmer & Cutter Z-12.
1—45" Seybold Trimmer & Cutter with 5 H.P. 220/440 Volt Motor, Rebuilt.
1—42" Dia. & 110" Face Pope Reel.
1—25" Dia. x 156" Perforated Face Sandusky Suction Couch. Complete.
1—22" Dia. x 138" Perforated Face Sandusky Suction Couch. Complete.
1—22" x 111" Vertical Size Press with Microrock and Rubber Rolls. A. F. Bearings with frame work. Pneumatically loaded.
1—24" x 102" Extractor Rolls. 20" Dia. Rubber Top Roll mounted with A. F. Bearings and Frame work. Spare Rolls.
1—22" x 96" First Press with Microrock Roll and Rubber Roll.
1—22" x 110" Press with Microrock Roll and Rubber Roll.
1—10-Knife Carthage Chipper with A. F. Bearings.
1—A.P.P. Rotary Centrifugal Pulp Screen, 40" Dia. x 42" Face. Serial #1274227.
1—#3A Bird Screen. S.S. Plates.
1—Hudson Sharpe Toilet Tissue Converting Machine. Serial #2123.
2—Packer 12-Plate Flat Screens. S.S. Bodies #.22 S.S. Plates. Less than 5 Years Old.
1—36" x 96" Saveall, Rubber Couch, S.S. Vat, A.F. Bearings.
1—Hummer Vibrating Screen.
1—Seybold Knife Grinder. Size G. 84" Table. Serial #4X802.
1—Sandy Hill Sulphur Burner. Complete.
1—54" Dia. x 48" Face Valley Iron Tub Beater.
1—53" Dia. x 66" Face Dilts 2000-lb. Iron Tub Beater with S.S. Hood.
16—Beater Rolls and Stands. Various Sizes.
5—Triplex and Duplex Pumps. Various Sizes.
1—DeZurick Consistency Regulator. Complete. One year old, never used.
1—8' x 10' Oliver Continuous Filter. Steel Tub.
1—100 H.P. Terry Turbine, Type G, 3615 RPM, 250 lbs. Steam Pressure. Back Pressure 35 lbs. Fully automatic with Terry Speed Reducer.
1—No. 2 Jones Pulper. A.F. Bearings. Spare Worm.
1—250 H.P. Ingersoll-Rand Diesel Engine Generator Set—G.E. Generator, 150 KW, 480 Volts, 720 RPM.
3—75 KVA G.E. Spirakore Transformers, Type HS, Class OA, 2400/4160 Y Primary to 120/240 Secondary.
1—60 H.P. G.E. Gear Motor, T.E.F.C. 440 Volts, 1730 Max./427 Min. RPM, 4.15 to 1 Ratio.
1—15 H.P. West. Gear Motor, T.E.F.C. 220 Volts, 87 RPM.
1—7½ H.P. West. Gear Motor, T.E.F.C. 550 Volts, 1165 RPM to 29 RPM.
1—7½ H.P. G.E. Gear Motor, T.E.F.C. 220/440 Volts, 1738 RPM, 9.2 to 1 Ratio.
1—Horton Clutch, AF. Bearings.

1000 Electric Motors from ¼ H.P. to 600 H.P. in Stock

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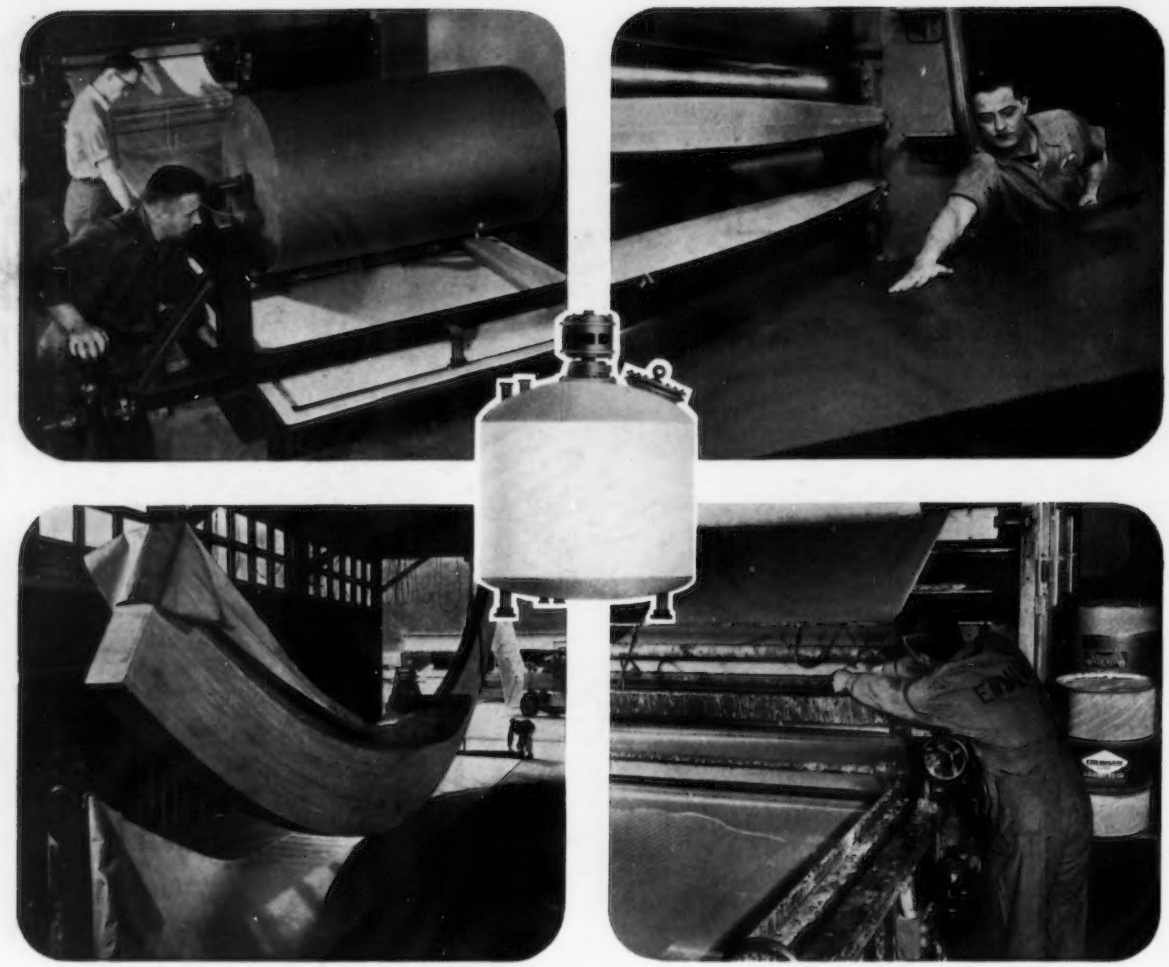

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